

CLASSIFIED ADVERTISING

RATES: Fifty words or less in 6-point light-face type only, one insertion, \$2.00, additional words four cents each. Three consecutive insertions \$5.00, additional words ten cents each.

PAYMENT in advance is required for advertising in this column.

REPLIES to advertisements with Box No. should be addressed to Air Conditioning & Refrigeration News, 5229 Cass Ave., Detroit, Mich.

POSITIONS WANTED

THOROUGHLY EXPERIENCED Manager for your commercial refrigeration department. Has technical and 12 years' successful practical experience in the organization and management of commercial departments. Can obtain volume sales, engineer any type of installation, and diagnose difficult service problems, thereby assuring profits. Will consider any location. Write Box 1073, Air Conditioning & Refrigeration News.

AIR CONDITIONING Department Organizer. A man, with 20 years' experience, starting with architecture, ranging through broad manufacturing and merchandising experience, and culminating in several years' work with leading air conditioning company, will be available after September first to a manufacturer or distributor to promote year 'round products. Knows design, man-management and promotional works. Has made five figure yearly income but would start on smaller basis with expanding possibilities. Write Box 1074, Air Conditioning & Refrigeration News.

REPAIR SERVICE

CONTROL REPAIR service. Your controls repaired by expert mechanics, with special precision equipment. Supervised by graduate engineers. We stress perfection and dependability before price. One year guarantee on domestic controls. Any bellows operated device repaired. **HALELECTRIC LABORATORY**, 1793 Lakeview Road, Cleveland, Ohio.

ALL MAKES of reciprocating type compressors rebuilt or repaired. Discharge plate, float valve and compressor body exchange service, specializing in Kelvinator and Frigidaire. New machine performance guaranteed. Standard size parts used—no oversize or reamed parts. Write or wire for price list and references. **RE-NU COMPRESSOR & SUPPLY CO.**, 2462 W. Fond du Lac Ave., Milwaukee, Wisconsin.

WORLD'S LARGEST Rebuilders of hermetic units. Specializing in Majestic, G. E., Westinghouse and Grunow. Dealers exchange price \$30.00 with 18 months' written guarantee. Parts for Grunows and Majestics all models. G. E. units wanted for cash. Send for catalogs. **G & G GENUINE MAJESTIC REFRIGERATOR AND RADIO PARTS SERVICE**, 5801 Dickens, Chicago.

GENERAL ELECTRIC and Westinghouse hermetic units rebuilt. Guaranteed unconditionally for one year and returned to you refinished like new. Units are entirely disassembled in our large modern shop, tested through every step of production during rebuilding with the most complete test equipment for accurate work, then subjected to exhaustive running tests under actual operating conditions. Each unit measures to exacting standards after rebuilding. Prices \$30.00 on General Electric DR-1, DR-2, and Westinghouse; \$35.00 on General Electric DR-3. Quotations furnished on other models. Quick service—guaranteed work. **REFRIGERATION MAINTENANCE CORP.**, 365 East Illinois St., Chicago, Ill.

BUSINESS OPPORTUNITIES

LIVE BUSINESS in nation's bright spot of over hundred thousand population. Business well established, location good, natural gas at reasonable rates. Selling with exclusive contracts, Servel Electrolux refrigerators, Tappan divided top gas ranges, Rudd water heaters, Bryant furnaces and Estate gas heatrolas. Health forces owner to sell. Box 1078, Air Conditioning & Refrigeration News.

PATENTS

HAVE YOUR patent work done by a specialist. I have had more than 25 years' experience in refrigeration engineering. Prompt searches and reports. Reasonable fees. **H. R. VAN DEVENTER (ASRE)**, Patent Attorney, 342 Madison Avenue, New York City.

Opens Wisconsin Store

CLINTONVILLE, Wis. — J. A. Gilbert, formerly of Chicago, has established Gilbert's Appliances at 170 South Main St. here to deal in new and used refrigerators and other household appliances.

PAR CONDENSING UNITS
28 MODELS
1-4 TO 20 H. P.
WRITE FOR FREE CATALOG
MODERN EQUIPMENT CORP.
DEFIANCE, OHIO, U. S. A.

Specify PENN
AUTOMATIC CONTROLS AND SWITCHES
FOR RECOGNIZED RELIABILITY
Write for Catalog
PENN ELECTRIC SWITCH CO.
GOSHEN, INDIANA

Philco Dealer Contract In Detroit Calls For Price Maintenance

(Concluded from Page 1, Column 2)

for each sale of a Philco product in violation of the price agreement, and damages up to \$1,000 for each advertised public offering for sale of a Philco product in violation of the agreement.

Following is the letter announcing that Philco distribution in the territory served by the Detroit distributor will henceforth be under the terms of the fair trade act:

Gentlemen:

This is to advise you that Philco products are and will continue to be sold at retail in accordance with and pursuant to the provisions of the Fair Trade Act of Michigan, being act No. 50 of the Public Acts of 1937, and for the purpose of assuring to you the benefits under said act, you will please be advised that the following Provisions from this date set forth are a part of and supplemental to our present written registered dealers agreement with you:

"Dealer will not advertise or sell or offer for sale, directly or indirectly, any Philco products (which, from any source, the Dealer has on hand or may hereafter purchase) below the minimum prices which may from time to time be stipulated by the Distributor for sale to consumers, nor will the Dealer make any refunds, discounts, concessions, or joint sales of any kind or any character for the purpose of, or which will result in decreasing the said stipulated prices. Distributor further requires of the Dealer that upon sale of such Philco products to another that the Purchaser agree that he will not, in turn, resell at less than the price so stipulated."

We are enclosing herewith written schedule containing the minimum resale prices now in effect for the Philco products listed therein. Your attention is directed to the fact that willfully and knowingly advertising, offering for sale, or selling any Philco products at less than the price stipulated in our Fair Trade contract is contrary to the provisions of said Fair Trade Act and is actionable at the suit of any person damaged thereby regardless of whether or not you have a signed contract.

W. H. EICHELBERGER,
General Manager

SOME OF THE TERMS OF THE AGREEMENT

PHILCO RADIO & TELEVISION CORP. OF MICHIGAN
RETAIL DEALER FAIR TRADE AGREEMENT

1. The term of this agreement shall be from the date hereof to May 31, 1939, but either party may sooner terminate it by giving written notice to the other.
2. Dealer agrees to sell Philco products at retail to consumers only.
3. Dealer agrees to sell Philco receivers only in their original cabinets.
4. Dealer agrees, upon notice by Distributor, to discontinue any advertising which in the sole opinion of Distributor may be objectionable in any way.
5. Dealer acknowledges that Philco products are in fair and open competition with products of the same general class produced by others and it is the desire of the parties hereto to fix the minimum resale prices of said Philco products, within the limits of the Fair Trade Act of Michigan, for the purpose of insuring a fair return on the resale thereof and protecting the purchasers of Philco products from unfair trade practices.

(a) Dealer will not advertise or sell or offer for sale, directly or indirectly, any Philco products, (which from any source, the Dealer has on hand or may hereafter purchase) below the minimum prices which may from time to time be stipulated in the agreement by Distributor for sale to consumers, nor will Dealer make any refunds, discounts, or concessions of any kind or character for the purpose of, or which will result in decreasing the said stipulated minimum prices.

Dealer may credit as part payment of the purchase price, the amount of trade-in allowance for used radios actually received by Dealer, such trade-in allowance to be limited to the reasonable value of such radios based upon the original cost, age, style, and condition thereof. Dealer will not sell or offer to sell any Philco products in combination with similar or other products manufactured by others at a single or joint price, unless such combination sale or offer has been approved in writing by the Philco Distributor.

(b) The minimum prices to the consumer will be those stipulated in written schedules designated as minimum resale price schedules under Dealer contracts

furnished, by mailing or delivering, from time to time to Dealer by Distributor, which schedules are to be considered as, and hereby are made a part of this agreement.

(c) In the event (1) of the closing out of Dealer's stock for the purpose of discontinuing delivering all Philco products, or (2) that any of said Philco products in Dealer's possession are damaged or deteriorated in quality, or (3) that Dealer has on hand any Philco products after this agreement has been terminated for any reason, Dealer shall, before offering any of said Philco products for sale at prices less than the minimum resale prices fixed thereof, give to Distributor 10 days written notice of his intent to sell said Philco products at such reduced prices.

Within the period of 10 days after the receipt of said notice from the Dealer the Distributor may, at its sole option, purchase all or any part of such Philco products then in the possession of the Dealer at the net price paid for such products or at the then net Dealer's price, less Distributor's charge covering deterioration or damage, and the cost of handling and reconditioning said Philco products for resale as new.

West Coast Jobbers To Form Association

(Concluded from Page 1, Column 3)

tional Refrigeration Supply Jobbers Association, called the meeting at the request of several other jobbers in this area. Purpose of the meeting is to form a Pacific Coast Jobbers Association which will work in conjunction with the National Refrigeration Supply Jobbers Association, and which will also treat with local problems.

It is expected that parts wholesalers from San Francisco, Los Angeles, San Diego, Seattle, Portland, Sacramento, Long Beach, and Phoenix, Ariz. will be in attendance at the meeting.

San Francisco Dealer Group Puts Curb on False Advertising

(Concluded from Page 1, Column 3)

offender and warn him that he will be reported to the Federal Trade Commission unless he sells his merchandise under its true colors.

The average complaint is cleaned up one way or another within a month. So far it has not been necessary to make a single report to the Federal Trade Commission. In one instance a man who had been selling as an air conditioner an outfit which could not possibly be classed as such found that he could not sell the product on its merits and went out of business.

This work is only one phase of the activity of the Air Conditioning Society of San Francisco. It also carries on an educational program, publishes a book of air-conditioning standards, does legislative work, and builds a spirit of cooperation among members of all branches of the industry. The group now has a paid-up membership of 104, one of the largest in the United States.

Started in 1932, the Society has grown constantly until it now has as members a majority of the major firms in the air-conditioning business in this territory. Average attendance at the monthly luncheon meetings runs in excess of 45. At every meeting, a talk on some subject directly related to air conditioning is given.

The "Standards of Air Conditioning For Human Comfort" are published by the association in a leaflet

which has been distributed to virtually all members of all branches of the industry in this territory.

The standards are based mainly on the Guide of the American Society of Heating and Ventilating Engineers, the Refrigeration Data Book of the American Society of Refrigerating Engineers, and a number of other similarly authoritative works.

First section of the pamphlet defines all important terms relative to air conditioning such as cleansing, comfort cooling, comfort zone, and so on. The standards are broken down by sections, taking in Scope, Design, Minimum Standards for Cooling Apparatus, Minimum Design Temperatures and Humidities for Comfort Heating, and 13 others.

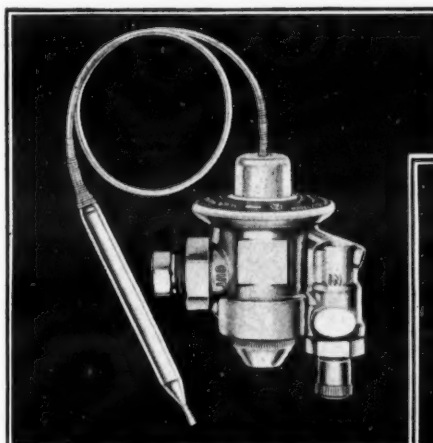
Officers of the Air Conditioning Society of San Francisco are: R. A. Folsom of the W. R. Ames Co., president; R. B. Plass of W. Harry Archer & Associates, vice president; and Jared A. Hill of the Pacific Gas & Electric Co., secretary.

Specialties Distributing Adds Stromberg-Carlson

DETROIT—Specialties Distributing Co., distributor of Electrolux refrigerators and Brunswick "Blue Flash" coolers, has taken on distribution of the Stromberg-Carlson line of radios in approximately 35 counties in eastern and central Michigan, according to Leonard Turnbull, president.

"Period" design in radio cabinets—Chippendale, Early American, or what have you—is one of the outstanding features of the Stromberg-Carlson line.

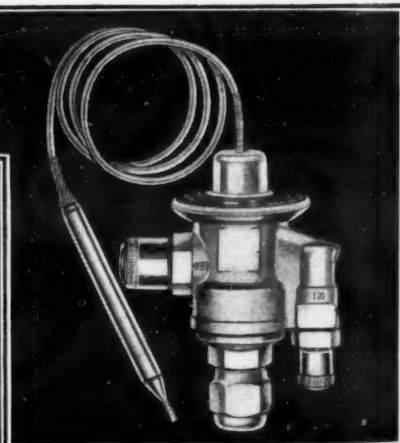
Announcing . . . NEW Dependability for Fractional Tonnage Refrigeration . . .



• NEW  MODEL 206
THERMOSTATIC
EXPANSION VALVE
(Fixed Superheat)



NEW  MODEL 204
AUTOMATIC
EXPANSION VALVE



NEW  MODEL 207 •
THERMOSTATIC
EXPANSION VALVE

- for
- Household Refrigerators
 - Room Unit Coolers
 - Beverage Coolers
 - Water Coolers
 - Serum Cabinets
 - Frozen Food Venders
 - Refrigerated Display Cases
 - Other small Tonnage Units


Manufacturers, Jobbers and Service Engineers—all have welcomed these three new A-P Expansion Valves with enthusiasm! For they bring typical A-P Valve Dependability and Efficiency to the *small tonnage units*—from 1/4 H. P. and up—for original equipment or replacement.

Brass Forged Bodies—Large Area Diaphragm—Self-Aligning Stellite Needle—Stainless Steel Seat—Fast, Smooth, Accurate Operation—these and all other well-known A-P features are now offered for the first time in New A-P Expansion Valves for fractional tonnage refrigeration! And the same "trouble-free service", so long a part of A-P equipped installations, is now extended to all applications *large and small!*

Be sure to get your copy of latest technical bulletins describing these new A-P Valves.

AUTOMATIC PRODUCTS COMPANY
2450 NORTH THIRTY-SECOND STREET
MILWAUKEE, WISCONSIN
Export Department, 100 Varick Street, New York City

DEPENDABLE

REFRIGERATION PARTS JOBBERS,
WHO RECOGNIZE QUALITY STOCK  CONTROLS
THE BYWORD FOR A-P CONTROLS

Air Conditioning & Refrigeration News

The Newspaper of the Industry

Trade Mark Registered U. S. Patent Office. Established 1926 as Electric Refrigeration News
Member Audit Bureau of Circulations. Member Associated Business Papers.

Written to Be Read on Arrival

VOL. 25, No. 1, SERIAL NO. 494
ISSUED EVERY WEDNESDAY

Entered as second-class
matter Aug. 1, 1927

DETROIT, MICHIGAN, SEPTEMBER 7, 1938

Copyright, 1938, by
Business News Pub. Co.

FOUR DOLLARS PER YEAR
TWENTY CENTS PER COPY

THE COLD CANVASS

By B. T. Umor

Quickies

With Tammany-Buster Dewey bringing in the semi-private lovelife of his star witness, Defendant Hines is probably hoping against Hope.

The so-called "sit-down strike of Capital" is expected to end this fall. Sitting on cold cash may be comfortable in summer but is likely to be chilly in winter.

"The trade of advertising is now so near to perfection that it is not easy to propose any improvement." So wrote Dr. Samuel Johnson in 1758.

Evidently Congressman Dies does not follow baseball. Although he linked Shirley Temple with the Communists, he completely overlooked the Cincinnati Reds.

Packaged Weather Helps Save a Life

An air-conditioning distributor furnished emergency squad service in New Jersey during the summer and helped to save a life. The incident happened during the Fourth of July week-end, and was only recently reported.

In a suburban town an 80-year-old woman fell and broke her hip. Age, and the nature of the injury, made the circumstances serious, and the patient had to be placed in a fracture bed at the height of a hot spell.

Pain, combined with the intense heat, were almost more than the aged woman could stand, and the attendant doctor felt that he could save her life only if he could alleviate the discomfort being caused by the weather.

The day was Sunday, July 3, when most of the working population was scattered at beaches and resorts for the week-end. The doctor called the Summit, N. J., supervisor of Northern Air Conditioning Corp., General Electric distributor, at 12:30 p.m. and requested an air-conditioning unit.

In 45 minutes the order had been completed, including paper work, and at 2 p.m. a G-E unit room conditioner was placed on a truck at Newark. An installation man, located at Asbury Park, burned up the roads to Summit.

At 3 p.m. he arrived, and an hour later the unit had been installed. Temperature of the room was rapidly approaching a comfortable level, and the patient was feeling better. The doctor thinks it saved her life.

Chilly Fingers

A cool studio means a more brilliant organ recital... but too much cooling can also mean a mighty chilly organist.

Under special orders, Columbia Broadcasting System porters come in every Sunday morning at 7 o'clock to cool the organ studio used by Julius Mattfeld, who is heard on the show called "From the Organ Loft" each Sunday morning.

Cooling the studio for an hour makes the organ sound twice as brilliant, says Mr. Mattfeld, who plays an electric organ. A hot, smoky studio, says he, makes the organ sound muddy and dead.

"A cool studio also makes me feel more peppy," says Mr. Mattfeld, "and as a result I play better."

Lately, however, the porters have been overdoing themselves a little. They poured so much cold air through the ducts a couple of Sundays ago that Mr. Mattfeld had to

(Concluded on Page 2, Column 5)

Proposed Code For Detroit Submitted By Committee

DETROIT—Proposed refrigeration code of the city of Detroit, setting up regulations governing the installation of refrigeration and air-conditioning systems in Detroit, has been given a final reading by the committee which has been working for nearly two years to draft an ordinance that would impose proper regulations and at the same time be in step with the advance made by the industry's technicians.

The entire text of the proposed code is published on pages 12 to 18. (This draft is being published by permission of Commissioner Joseph

A meeting of Detroit refrigeration contractors and service men to discuss the proposed code will be held at 8 p.m. on Sept. 21, in the Diamond Temple, 5646 Lawton Ave., under the sponsorship of J. M. Ober, Inc., refrigeration supplies jobber. A program of talks and entertainment is also planned.

P. Wolfe of the Department of Buildings and Safety Engineering.)

Since the commission is not planning to prepare copies of this proposed code for general distribution, the NEWS is pleased to present the entire text in this issue for the benefit of those who may have an interest in its application in the Detroit area, and for those in other

(Concluded on Page 22, Column 4)

Contractors—Union Agreement Results In a Damage Suit

DETROIT—Claiming that he lost the plumbing and heating contract for the Michigan Mutual Liability Co. hospital in 1937 because his firm was not a signatory to the "Voluntary Trade Agreement of the Plumbing, Heating, Piping, Refrigeration & Air Conditioning Contractors Within the Metropolitan Districts of Detroit," Leo J. McTighe, doing business as C. B. Whalen Co., master plumbers, has filed a \$25,000 damage suit in Circuit Court here, charging eight defendants with conspiring to violate the restraint-of-trade statute and to injure the plaintiff in his business.

Defendants in the suit, in addition to the Administrative Committee of the Voluntary Trade Agreement, are Coffey & Granlund, Inc.; Harrigan & Reid Co.; Detroit Association of Master Plumbers; and Charles A. Bowen, Ralph P. Peckham, Fred Barton, and Ray W. Adams, each individually.

The suit arose over the operation of the Voluntary Trade Agreement, which was formed Oct. 15, 1936, by approximately 200 contractors engaged in the plumbing and heating

(Concluded on Page 24, Column 1)

Fall Sales Campaign Is Seen As Outcome of Frigidaire Meeting

DAYTON, Ohio—Summoned to attend a special summer meeting, 100 distributors, branch managers, and district sales managers of Frigidaire division of General Motors Corp. were in this city two days, starting Aug. 29. Plans for a special nation-wide sales drive were discussed.

E. G. Blechler, general manager of the Frigidaire division, said company officials believe there is a feeling of optimism throughout the country sufficient to warrant increased efforts on the part of the entire selling organization.

(Concluded on Page 2, Column 3)

Important Documents Published in Full In This Issue

1. The Detroit Code

Ever since the "gas war" in Chicago back in 1929, the NEWS has been publishing proposed municipal codes, revised codes, and amended codes regulating the installation and operation of refrigerating and air-conditioning systems.

Particularly in Chicago, New York City, and Washington, D. C., municipal safety officials have labored long and hard in their efforts to devise a code which would be acceptable to the various interests affected by such laws, and at the same time satisfy their own desires to protect the public against every possible hazard.

The problem of drafting a fair, reasonable, and workable code would be difficult enough under the most favorable conditions since the constant progress of the industry has a tendency to make the regulations obsolete before they can be adopted and put into practice.

But the job of producing a model code has been practically impossible in the three cities mentioned because of the ever-present political influences which dominate all of their proceedings.

It is with renewed hope, therefore, that the NEWS presents in this issue a code which has been worked out in DETROIT after two years of preparation. At least the atmosphere in which the committee has worked in Detroit has been much more favorable and there has been ample opportunity to profit by the experiences in other cities.

The entire text of the proposed Detroit code is officially released by the committee in this issue of the NEWS.

2. The Berle Report

Also published in full in this issue is the Report on Monopolies by A. A. Berle, Undersecretary of State, former University of Columbia professor, and intermittent member of the Brain Trust.

Prepared at the instigation of Trust-Buster Thurman H. Arnold, this thoroughgoing report was intended as a preface to the work of the committee on monopolies of the Temporary National Economic Commission.

Berle not only has produced some excellent and thought-provoking reasoning in this report, but his language is so clear and vivid that it makes exciting reading out of both abstruse and practical economics.

It may turn out to be one of the important political and economic documents of our time; and should be read by every business man who is struggling to readjust his sights for clearer vision through the foggy muddle which characterizes so much public thinking today.

Sam Mitchell Sails on European Tour

QUEBEC, Que., Canada—Sam C. Mitchell, who recently resigned as director of advertising and sales promotion for Kelvinator division of Nash-Kelvinator Corp., sailed from here on the Empress of Britain for a two-month trip to Europe.

Accompanied by his wife, Mr. Mitchell will tour England, France, Switzerland, and Italy, and expects to return to the United States Oct. 25, after which time his future plans will be announced.

Carrier's Financing Program Involves \$2,500,000 Issue

SYRACUSE, N. Y.—For the purpose of considering and probably approving a financing program and changes in the capital structure, whereby the board of directors have recommended that the stockholders approve a \$2,500,000 issue of 10-year convertible debentures, stockholders of Carrier Corp. will hold a special meeting Sept. 12.

Proceeds of the debenture, according to the proposed plans, will be used to pay off the present bank loans of \$1,500,000 and to provide additional working capital for the corporation.

It is intended that the debentures will be offered to the public during the fall of 1938, and that they will be convertible into the common stock of the corporation at conversion prices above the market price at which the common stock is selling at the time of the public offering. This means, in effect, that if the individual who buys a debenture converts his debenture into stock, he would get more stock than the equivalent amount of money he spent for the debenture would have bought at the time the debentures were first offered for public sale.

The stockholders are asked to approve a change in the authorized capital from 500,000 shares of no-par common stock to 700,000 shares

(Concluded on Page 15, Column 3)

H. V. Higley Elected President of Ansul

MARINETTE, Wis.—H. V. Higley, formerly secretary-treasurer of Ansul Chemical Co., was elected president of the company at a meeting of stockholders and directors held here Sept. 1. Mr. Higley succeeds F. G. Hood, founder and president of Ansul, who died suddenly Aug. 9 after being stricken with a heart attack.

F. J. Hood, son of the former president and well known throughout the trade as "Jim" Hood, was elected secretary-treasurer and a director of the company, taking the post formerly occupied by Mr. Higley.

Mr. Higley, formerly chief chemist for the Isko Co., became associated

(Concluded on Page 23, Column 4)

J. A. Seeger, Cabinet Firm Founder, Dies

ST. PAUL—John A. Seeger, founder and chairman of the board of the Seeger Refrigerator Co., died Aug. 29 at his home here. He would have been 85 years of age Dec. 19.

During his business career here, which extended over a period of 65 years and paralleled the growth of the city, Mr. Seeger took a very active part in civic affairs, and was prominent in many of the activities that marked the civic progress of St. Paul.

Mr. Seeger came to St. Paul as a youth from Covington, Ky. Educated in St. Paul schools, his first job was

(Concluded on Page 24, Column 3)

Standard Wiring Cost on Range Is Plan In Capital

WASHINGTON, D. C.—A step away from the direct wiring subsidy on electric ranges has been taken by the Electric Institute of Washington with a plan which includes a standard wiring charge of \$35 in the established retail list price of the range.

The agreement was worked out over a period of months following a

(Concluded on Page 24, Column 2)

Distributors In Detroit Cool To Price Law Trial

Zenith Dealer Franchise Stipulates Price Control; N. Y. Law Upheld

DETROIT—While Buhl Sons Co., distributor of Zenith radios, franchises its dealers under a standard factory agreement calling for maintenance of established retail prices, none of the major distributing outlets for radios in the Detroit area plan to follow Philco's lead in placing its prices under the Fair Trade Act of Michigan, inquiry by the NEWS last week disclosed.

Action of Philco Radio & Television Corp. of Michigan in franchising dealers under the Michigan Fair Trade Act was described in last week's issue of AIR CONDITIONING & REFRIGERATION NEWS.

The clause in Zenith's household radio dealer authorization calling for maintenance of retail selling prices reads as follows:

"The Distributor agrees to use all legitimate means to maintain Zenith

(Concluded on Page 2, Column 3)

Philco Gets Injunction Barring Price-Cutting

NEW YORK CITY—A final judgment restraining a New York City radio retailer from cutting prices or in any other way violating a contract signed under this state's Feld-Crawford fair trade act has been obtained by Philco Radio & Television Corp. of New York, distributor of Philco products in the New York-New Jersey territory.

The decree was signed by State Supreme Court Justice Lloyd Church, against Morris Shapiro and Harry Krantz, co-partners operating Rite Radio Stores at 74 Cortlandt St. here.

The judgment restrains the defendant retailer from cutting prices

(Concluded on Page 2, Column 4)

Factory Branch Replaces G-E Boston Distributor

BOSTON—Establishment by General Electric Co. of a direct factory distributing branch here for the wholesale distribution of its major appliance lines in the New England area formerly served by W. L. Thompson, Inc., has been announced by Ralph J. Cordiner, manager of G-E's appliance and merchandise department. Location of the branch is at 700 Commonwealth Ave.

The Thompson organization relinquished its previous responsibilities as of Aug. 26, Mr. Cordiner's announcement said, except for the sale and rental of G-E water coolers, and the assets purchased by G-E.

C. M. Wilson has been appointed branch manager, and V. W. Brown,

(Concluded on Page 24, Column 4)

A.S.R.E. Sets Meeting Dates and Places

NEW YORK CITY—Hershey, Pa. has been selected as the site and May 22-24 as the dates for the 1939 spring meeting of the American Society of Refrigerating Engineers, it was announced following a meeting of the A.S.R.E. national program committee here last month.

Sessions of the spring meeting will be held at the Hotel Hershey. The town of Hershey is the place where the chocolate bars and products of the same name are made.

(Concluded on Page 23, Column 5)

'30% Less to Run' Claim for Electric Units Is 'Conservative,' Tests Show

WASHINGTON, N. J.—Claims made by the Electric Refrigerator Association of New York in its recent campaign that an electric refrigerator costs 30% less to operate than any other kind have been substantiated by Consumers' Institute of America, Inc. in tests made on several makes of refrigerators, and reported in the August issue of Consumers' Digest.

The report in Consumers' Digest is a digest of material which appeared in the June Consumers' Research Bulletin.

"At the average rates for gas and electricity in New York City," the report states, "this claim (30% less for electric refrigerators) on the basis of the tests reported, is conservative even for some of the electric refrigerators which are less efficient than the best; the savings in some cases might amount to considerably more, indeed."

"In most localities," the report says, "a good electric refrigerator will cost less to operate than will a gas refrigerator, and only where the gas rate is very low will the reverse be true."

Buyers of refrigerators would have much cause for rejoicing if sales organizations of refrigerator companies had made as much progress serving consumers as engineers have made in improving operation of the units, declares Consumers' Digest.

"By notably improving cabinets and refrigerating mechanisms, engineers have lowered the electric current required to operate a household refrigerator to a half or a third of what it was 10 years ago," the article declares. "But sales organizations of refrigerator companies have not been infected with the same spirit of progress, for even in these times, they do very little to give satisfaction to the consumer who has bought a 'lemon,' or whose refrigerator requires servicing or overhauling."

"So far as repairs and servicing of electric refrigerators are concerned, even by the most reputable makers, the policy of 'caveat emptor' seems to be carrying on securely."

Greatest immediate need and greatest opportunity in the household refrigerating field is for improvement by manufacturers in their treatment of consumers whose refrigerators have turned out to be "lemons," the article declares.

"A liberal, prompt, and low-cost replacement policy would work to the advantage of both manufacturer and consumer," the report continues. "To the manufacturer the problem is a minor one, since the first cost of new units and parts is very

small—perhaps one-fifth of the list price, or less. To the consumer the outlay required to get his refrigerator into shape may be almost a financial catastrophe."

Advertising claims of 25% savings in current consumption by the use of a defrosting clock are grossly exaggerated, the report declares. There would be little, if any, actual saving beyond that accomplished by the simple effect of raising the average temperature inside the refrigerator, which the clock does bring about, it continues.

"There is no need for a clock to turn the refrigerator off, to accomplish this," the report says. "Merely raising the temperature control would do this, and at much less cost—if a higher average inside temperature is actually wanted."

Regarding the saving in energy cost by shutting off the refrigerator during the winter months, the report states that, against a possible saving of \$1.20 to \$1.75 per month, maximum operating cost range shown in its tests on various refrigerator models, "the best evidence at present available indicates that there may be some leakage of refrigerant (with units which are not sealed), which leakage would not occur if the mechanism operated continuously; with sealed units, however, leaking or any other damage would be much less likely."

"With sealed units, therefore," the report concludes, "there would surely be some saving by not running the refrigerator during the winter, or whenever it is not needed; with open units, however, it is at least questionable whether there would be an actual long-run saving."

Refrigerators reported on in the article were tested according to the standard procedure described in "Household Electric Refrigerator Standards" of National Electrical Manufacturers Association, published in March, 1937, and were also tested for safety of electrical insulation, the report states.

In addition, they were subjected to an endurance test run under severe temperature and humidity conditions, and to tests for comparative noise of operation, and for resistance of the interior porcelain enamel to food acids.

"Efficiency was well maintained by the refrigerators during the endurance test," the article reports. "Refrigerating capacity was adequate in all cases. Staining of porcelain enamel did not occur in any of the models reported. Thermostatic control was judged satisfactory in all cases."

Detroit Radio Firms Cool on Price Law

(Concluded from Page 1, Column 5) retail selling prices by all authorized Dealers in such merchandise, and the dealer agrees to accept and abide by such means in furtherance thereof."

While the franchise agreement does not state specifically that a retailer may lose his "authorized dealer" status because of price-cutting, it does, however, carry the provision that:

"If the Dealer shall fail to perform any of the obligations imposed upon it (him) as hereinbefore set forth, the Distributor shall have the absolute right at its option forthwith to cancel and terminate the authority herein conferred upon the dealer..."

The Zenith dealer franchise also provides that "At the expiration of the Dealer's authority to act as an authorized Dealer, or at the sooner termination of said authority... the Distributor or its (his) assigns at its (his) of their election shall have the right to repurchase from the dealer any unsold or undelivered stock, or any part thereof, of Zenith merchandise theretofore purchased by the Dealer from Distributor and then in the Dealer's possession, and the Dealer agrees to offer any such unsold or undelivered stock to the Distributor or its (his) assigns before attempting to sell it to anyone else."

Franchises established under the agreement, unless otherwise terminated, remain in force until March 31, 1939.

Although its franchise with dealers gives it a means of enforcing list prices on Zenith radios, Buhl Sons Co. does not anticipate any difficulty in maintaining standard prices on 1939 sets, said F. E. McDonald, radio sales manager of the distributorship. He said that little trouble with price maintenance had been experienced.

Radio Distributing Co., RCA-Victor distributor in the Detroit territory, reported that it had no price maintenance clause in its 1939 dealer contract, and that it had no plans for price control on radio sets under way at present.

Lou Hock, radio sales manager of the company, said he expected the 1939 radio market to be considerably firmer, as far as prices were concerned, than it was in 1938.

Consensus among other radio distributors in the Detroit area was that they were not important enough as yet as individual factors to warrant their listing their products under Michigan's fair trade act, but that they tried to keep abreast of any price-cutting tactics on the part of their dealer organizations.

One sales manager expressed the apparent feeling of the group when he said that "we try to check up on our dealers regularly, to uncover any reported price cutting, but we can't legally take away their franchises for that alone."

Fall Drive Indicated By Frigidaire Meeting

(Concluded from Page 1, Column 2)

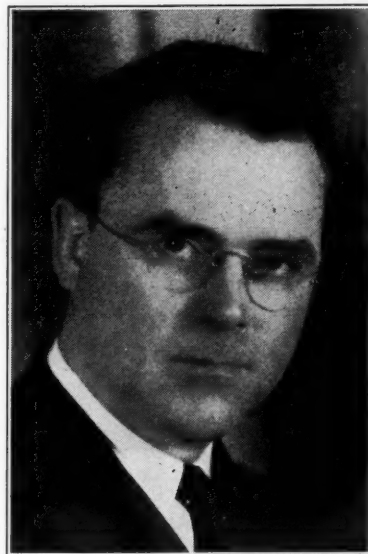
"While the fall season is not recognized as the peak period for our type of merchandise," said Mr. Biecher, "we believe we should leave no stone unturned to obtain as many orders as possible. To that end, we have formulated special plans for assuring peak activity on the part of every sales representative in every district in the country."

"Lack of sufficient customers' orders so far this year forced us to curtail production. However, we are now of the opinion that no further curtailment from our present operation will be necessary during the balance of the year."

"Although we do not expect customers' orders sufficient to keep our entire force busy at this time of the year, we will, in line with our regular policy of stabilizing employment as much as possible during the fall and winter seasons, assign certain groups to the production of products and parts not required until after the first of the year. These will be stored until required for the heavier selling season."

"In the meantime, our present sales plans call for keeping other production employees working as many days each week as possible supplying goods for immediate shipment."

Steps Up



J. F. O'DONNELL

Assistant sales manager of the merchandising division of Westinghouse Electric & Mfg. Co.

Judge Rules For Philco In Price-Cutting Suit

(Concluded from Page 1, Column 5) or in any other way violating the terms of the fair trade contract entered into with the Philco distributor on July 18 last, in which the dealer agreed to sell Philco products at prices not less than those fixed by the manufacturer.

Previously, a stipulation had been filed before Justice Church, consenting to the granting of an injunction in favor of Philco, the petitioner stating that Philco had "laboriously and expensively established for the trademark, name, and brand 'Philco' over the past 10-year period" its goodwill and reputation.

The petition claimed that, in order to overcome unfair price cutting competition and to prevent the Philco trademark from being used as a loss leader, the company had entered into fair trade contracts with dealers in its territory.

Contract signed last July between Philco and Shapiro and Krantz specified that the defendants were not to advertise or sell at retail any of the company's sets at less than the prices set forth in the company's schedule last June 1, the price schedule given to the dealer by the company when the contract was signed.

Binder's Opens 4-Floor Store In Trenton

TRENTON, N. J.—Binder's, local electrical supply company, has opened a new four-floor store at 130 E. State St., and will carry a complete line of Westinghouse appliances.

The company was formed in 1914 at 184 S. Broad St., moved to 84 E. State St. last year, and, to keep up with its expanding volume of business, has now occupied the larger quarters.

Eicholz Will Manage Crosley Retail Store

MONTGOMERY, Ala.—R. H. Eicholz has been appointed manager of the local branch of Auto-Lec Stores, Inc., New Orleans, Crosley refrigerator distributor in this territory.

Mr. Eicholz formerly was connected with the New Orleans headquarters, and succeeds R. Conley, who has become manager of Auto-Lec's branch at Mobile, Ala.

Service Man Becomes Hotpoint Dealer

LAWRENCE, Mich.—R. F. Wild, who has been engaged in service work on household refrigerators here, has recently been appointed as a dealer for Hotpoint refrigerators and ranges, by the Central Electric Supply Co. of Battle Creek, Mich.

Mr. Wild says that since he has completed the Utilities Engineering Institute course in refrigeration he is usually consulted on service problems in his territory and that this entree gives him an excellent chance to sell new appliances to his service customers.

THE COLD CANVASS

By B. T. Umor

(Concluded from Page 1, Column 1) play his program in a topcoat—and a borrowed one, at that.

Sun Spot Cycle

Probably this piece of information won't do a thing to stop claims made by salesmen as to the relative merits of their respective refrigerators, but here it is, anyway:

Sun spots are the best refrigerator known to man, and they work on the same principle as man-made refrigerators, says Prof. John W. Evans, who is acting chairman of the University of Minnesota's astronomy department.

Prof. Evans explains that "the heated gas expands, and cools the atmosphere. While the temperature of the sun is 10,800° F., the center of this whirlpool is only 7,200°. The sun spot could make an object taken from the sun's atmosphere 3,600° cooler."

Labor Laws, British Style

Every new step toward Socialism in this country has its defenders who tell you in a superior, offhand way that "They've had it in England for a generation."

Generally they get away with this bluff because conservatives haven't taken the trouble to arm themselves with the facts about social legislation in Great Britain.

An American government commission is now in Britain studying labor laws over there. It will find no counterpart of our Wagner Act, but a two-way law that should be enlightening to the commission.

It prescribes the rights of both parties to labor disputes. General strikes and mass picketing are specifically prohibited. It forbids the assessment of political dues by the unions without express authorization from members.

The Whitley Commission in 1916 proposed self-government as the controlling principle in industrial relations and self-government remains the controlling principle.

An Industrial Court is the tribunal for adjusting wage disputes. On it sits a representative of the employers, one of the workers, and a third who is chairman and presumably impartial. It cannot enter a dispute when either side objects, and its decisions are not binding.

New Orleans Dealership Switches To Crosley

NEW ORLEANS—Sherrouse Appliance Co. has been appointed dealer for Crosley refrigerators in New Orleans and suburbs. The firm had been handling Servel Electrolux refrigerators since its organization last spring.

TRAINED MEN Furnished FREE!

Save time, trouble and money when you need men. Use the U. E. I. Free Placement Bureau. No charge to you or prospective employer. It is our contribution to the industry. We have U. E. I. trained men available in all parts of the country. For 12 years our graduates have made good as shop mechanics, and as installation and service men in leading organizations. Next time you need a competent man, phone, write, or wire the U. E. I. Free Placement Bureau.

UTILITIES ENGINEERING INSTITUTE
404 N. Wells St. Established 1927
Chicago, Illinois 17 West 60th St. New York, N.Y.

Compressors

M&E
EST. 1866

MERCHANT & EVANS CO.
Phila., Pa., U.S.A. Plant at Lancaster, Pa.

PRESTO ICE TRAY
HAS WHAT IT TAKES

ICE CUBES INSTANTLY
ONE OR A DOZEN AS (AND WHEN) YOU NEED THEM

There is no doubt about it—the greatest need for ice cubes is on those frequent daily occasions when one, two, or three persons want a few ice cubes in a hurry. And only Presto Tray with Rubber Grid has what it takes to give one or a dozen cubes instantly, full-sized, cold and dry, without disturbing the others. No fuss! No bother! No waste!

In less time than it takes to tell, your salesman can demonstrate conclusively how only the Magic Finish Presto Tray with Rubber Grid gives all the advantages of a fast-freezing metal tray plus all the conveniences of a rubber grid.

If you have not already done so—be sure and insist that your new refrigerator come factory-equipped with Magic Finish Presto Ice Trays.

INLAND MANUFACTURING DIVISION
General Motors Corporation Dayton, Ohio

WHEN A FEW ICE CUBES ARE PLENTY... DON'T RAID A TRAYFUL... USE

PRESTO ICE TRAY with Rubber Grid

1939 will be a great year for every ~~CROSLEY~~ dealer

~~CROSLEY~~ PUSH BUTTON YEAR★

428 SOLD FROM
ONE AD



at \$9.99

Crosley offers a traffic builder that rolls up amazing sales totals. AC-DC. Push button and knob tuning. Electro-dynamic speaker.

at \$24.95

Crosley will win a great market with this portable push button electric radio-phonograph. Beam Power tube delivers greatly improved record reproduction. New self-starting motor and high impedance pick-up. Leather strap on flush cover makes it easy to carry. Radio is tuned by knob or by instantaneous positive push buttons.

Compare Crosley radios with all competitive models and note the reason dealers are making more sales is better tone, better performance, more tubes, bigger speakers and better circuits AT ALL PRICE LEVELS.

NOTHING LIKE IT
FOR THE MONEY



Other console,
table and auto models equally
fast sellers and profit makers



at \$19.99

Crosley presents a value in a superheterodyne 6 tube regular and shortwave receiver (the "SIXER") even greater than the famous "FIVER". 5 push buttons for quick, positive tuning in addition to conventional knob tuning. 5-inch dynamic speaker. Brown plastic cabinet. Out-performs anything in its price class.

at \$49.95

Crosley presents a CONSOLE ELECTRIC RADIO PHONOGRAPH of beauty and great efficiency. Power transformer with Beam Power tube delivers exquisitely true record reproduction. Illuminated Radio Log dial. Push button radio tuning as well as conventional knob tuning. Simple walnut-finished cabinet suggests elegance. Thousands will buy now that such quality is at this price level.

Prices slightly higher in South and West

★NOW, MORE THAN EVER...

You're *there* with a ~~CROSLEY~~

THE CROSLEY RADIO CORP., CINCINNATI • POWEL CROSLEY, Jr., Pres. • Home of "the Nation's Station"—WLW—70 on your dial

Specialty Selling Methods

Space Heaters Become Major Profit Item For Veteran Dealer In Past Few Years

PETOSKEY, Mich.—Oil burning space heaters are opening a new and potentially profitable appliance field asserts Glenn Bain, manager of the refrigeration department of the Bremmeyr-Bain Co. here, successful merchants in the Michigan resort territory since 1876.

Bremmeyr-Bain Co. has handled space heaters for a number of years, but according to Mr. Bain, it has only been in the past two or three years that they have become a major item in the appliance business.

Aside from the sale of Quaker and Coleman heaters at retail the company sells space heaters at wholesale over the entire Michigan resort area, through small dealers in farm communities.

"The farmer has been the first to take to the oil space heater," Mr. Bain said. "For many years farmers in this country have been burning wood, but now that the wood has been depleted, they turn to oil. The farmers understand the use of oil, because in many cases they have been using an oil cook stove for years. Electric stoves are coming into the picture for cooking, and

oil-burning space heaters are used for heating."

The Bremmeyr-Bain Co. handles Westinghouse refrigerators and electric stoves, Westinghouse ranges, and Briggs refrigerators. Most of the business is obtained from store traffic.

Outside solicitation of resort residents at their cottages is an impossibility, Mr. Bain states. While the city housewife living in a cottage is often courteous to a salesman, she will not buy from a man who comes to the door, no matter how well the company he represents is known.

"We advertise in the Petoskey papers, and the resorters come in and buy," Mr. Bain says. "As an example, one lady came in early this year and bought a 13-cu. ft. refrigerator. Last week she came in again and said she would need more refrigeration over the week-end, as guests were arriving at her summer home. We sent out an 8-cu. ft. Westinghouse box, which we knew would meet all her requirements, and she is perfectly well satisfied with it."

In addition to appliances, the Bremmeyr-Bain Co. sells hardware,

home furnishings, and maintains a complete plumbing and heating business. Timken oil burners are sold by the heating department and Mr. Bain reports that sales during the last two years have been unusually good.

"The resorters who come to this area are constantly improving and remodeling their cottages and summer homes," Mr. Bain relates. "This keeps our contracting department busy all through the spring and summer season."

While the gross volume of business of the company has been increasing during the last three years, the net profit has been considerably reduced by new government taxes, Mr. Bain says.

"Last year we did not make any special provision in our bookkeeping for the handling of social security and unemployment taxes, and the result was that the money came out of our profits at the end of the year. This year we have set up these taxes in the selling price of our merchandise and hope to come out better."

"These taxes cannot be handled by guess work—we have to know how much they amount to every month. With a payroll of from 44 to 46 employees, the new taxes add up to a considerable sum of money, which must be paid out of the gross profits of our business."

New G-E Dealership Opened In Dayton

DAYTON, Ohio—Main Appliance Co. has been opened here by H. E. Leingang, George Yelton, and Jack Rodgers, handling a complete line of General Electric appliances.

Knoxville, Tenn. Dealers See Appliance Sales Boom In Offing as TVA Power Is Assured

KNOXVILLE, Tenn. — Electrical appliance dealers here anticipate a decided boom in sales, following official announcement of the taking over of the Tennessee Public Service Co. by the city and the Tennessee Valley Authority.

Jubilant of dealers was expressed in a 16-page section of an extra edition of the Knoxville News-Sentinel in which confirmation of the deal was officially announced.

LEGAL SNARL UNWOUND

Word from New York City announced that more than 81% of the outstanding bonds are in escrow in Guaranty Trust Co. Charles Sney, attorney representing Tennessee Public Service, delivered the required seven-day notice to the city and to TVA, informing the two parties that TPS was ready to sell.

Knoxville's mayor and other city officials and representatives of TVA said they would go at once to New York City to handle details of selling the six million dollars with which to pay for the city's share of the system, and to close the deal. They said it would be about 10 days before the property actually changes hands.

LONG CONTROVERSY

The to-be-or-not-to-be-a-TVA-town question has been a Knoxville problem ever since 1935, at which time the city voted to purchase power from TVA and establish its own distribution system. Clouds of political confusion arose, however, before it had been definitely determined whether the city would build its own plant or purchase the facilities of Tennessee Public Service.

Eventually the city commenced construction of the first unit of its own distribution system, and later reopened negotiations with TVA and Tennessee Public Service, which resulted in the utility's retiring from the local field.

Anticipating an increase in sales in the event Knoxville obtained TVA power, dealers here have laid in heavy stocks of appliances to take advantage of the deal.

Appliance sales by Knoxville dealers will be boosted at least 25% by the coming of TVA, said Ernest Fielden of Fowler Bros., Westinghouse dealer. Sales this year by the Fowler firm already are 140% ahead of quota, Mr. Fielden said, and also are considerably higher than comparable 1937 figures.

"I know of many rural families who are just waiting for electrification extensions into their neighborhood to modernize their homes," he added.

DEALERS GET SET

Joe Hurley, manager of Knox Dry Goods Co., anticipates a heavy demand for all types of electrical appliances. The store has rearranged its furniture department, and is stocking a more complete line of appliances, with Dave Boriss as manager.

Lester Maxwell Furniture Co. already has begun to take orders under the EH&FA plan, providing 48-month payment terms.

Half of the main floor of Sterchi Bros.' big 13-story store, headquarters for the Sterchi stores over the south, is being turned over to electrical appliances and equipment. Two complete electric kitchens also have been installed in the store.

All Knoxville appliance dealers are cultivating the new market with a heavy barrage of display advertising. Regarding TVA power, advertisements point out that the people "asked for it, waited for it, now it's here." With rates estimated as 40% lower, the advertisements point out that the savings can be used to "buy the new electrical appliances that you have been wanting."

'Bob' McDavid Puts Sports Knowledge To Work In Appliance Promotion

BIRMINGHAM, Ala.—R. P. (Bob) McDavid, one-time sports editor of the Birmingham Age-Herald and now president of R. P. McDavid & Co., Kelvinator distributor in this territory, and also president of the Electric Bureau of Birmingham, has used his early sports background to good advantage in building his firm's operations into a million-dollar business.

A natural showman, Mr. McDavid seems to have the knack of doing something spectacular at the psychological moment, and he has done much to popularize Kelvinator electrical appliances in Alabama.

\$40,000 ON BROADCASTS

It was Mr. McDavid who first hit upon the idea of broadcasting baseball and football games in Alabama as a means of putting over the sales message of his own concern and that of his dealers. In the last seven or eight years he has spent \$40,000 or more for broadcast time.

He was the first to put Alabama and Auburn football games on the air. That was back in the days when he had to go to the college presidents and talk them into letting him have the broadcast privilege. They then feared that the broadcast would hurt attendance, but past events seem to have borne out Mr. McDavid's contention that the broadcasts would increase gate receipts, rather than lessen them.

BASEBALL, TOO

And not only have these broadcasts helped the colleges, but they also have done much to help Mr. McDavid's business. He claims his concern sells more refrigerators and other appliances than any other distributor in the state.

In addition to football, Mr. McDavid took to putting baseball games on the air, especially those played by the Birmingham Barons in the Southern league. He developed E. L. (Bull) Connor as a radio announcer, and Mr. Connor became so popular that he was first elected to the legislature and now is a member of the Birmingham city commission.

Melvin Israel, Mr. McDavid's football announcer, later stepped up to the regular staff of the Columbia Broadcasting System. His sales manager, B. C. McCoy, can give a running account of a football game as easily as he keeps salesmen busy.

Mr. McDavid was with Clark & Jones, pioneer appliance store, for several years before establishing his own distributorship. It is the dramatic events that he likes to put on the air, the kind where listeners glue their ears to the loud speaker and won't turn off, even though a "commercial" goes on now and then.

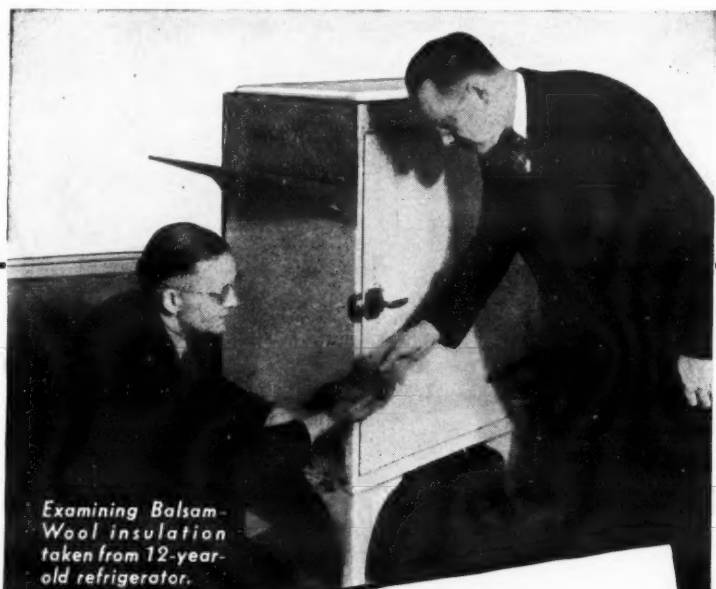
"Some of the dealers may think that the going is still hard in the appliance business," he commented recently, "but I can recall a time just a few years ago when the utility was our biggest competitor in the refrigerator business, demonstrating boxes almost indefinitely and paying salesmen more commissions than we could stand. Today, the utility, instead of selling boxes direct, is out of the merchandising business, and gives every assistance to the dealers."

GOODBYE TO PREMIUMS

"Also in those early days all kinds of premiums were being offered with refrigerators. One dealer offered a turkey with each sale, another a 'pantry full of groceries,' and another a radio. It was a 'catch as catch can' business, with no holds barred."

"But today we operate under a code. No premiums are allowed; neither are home demonstrations permitted on refrigerators. We have a definite code of ethics, and last year only three or four violations were reported."

"Birmingham is well up in the list in the way it has taken to electric refrigerators. More than 32,000 units are in use here, of which 8,900 were sold in 1937. Now the range, the water heater, washer, ironer, and air-conditioning equipment are right on the heels of the refrigerator. We have covered other major appliances in our code of ethics, and are optimistic as to their sales possibilities in the future."



Examining Balsam-Wool insulation taken from 12-year-old refrigerator.

"DISSECT"
12-YEAR-OLD REFRIGERATOR—
FIND BALSAM-WOOL IN PERFECT CONDITION!

Home—that's the final proving ground for the permanent performance of any refrigerator insulation. After 12 years of testing in this proving ground, Balsam-Wool is still performing 100%. Here are the facts—

Recently, a 12-year-old refrigerator was taken from the kitchen of a Chicago apartment house and torn down in the presence of qualified witnesses. The Balsam-Wool, after 12 years in continuous operation, was nestled snugly clear to the top of the box—no packing or settling had occurred. T. Shantz Hansen, Superintendent of the Minnesota State Forestry Experimental Station, found the Balsam-Wool dry as toast and clean as the day it was installed. There was not a trace of moisture, packing or disintegration.

Whether used in hermetically sealed spaces—as in the 12-year-old refrigerator—or in the form of sealed slabs, Balsam-Wool insulation is the sure and economical way to obtain lasting insulation efficiency for refrigerators . . . as use in more than 3,700,000 refrigerators has proved. Complete information will be worth while having—write for it!

WOOD CONVERSION COMPANY

Refrigeration Sales Division

360 North Michigan Ave.

St. Paul, Minn.

Chicago, Illinois

New York, N. Y.

BALSAM-WOOL

SEALED INSULATION SLABS

PRODUCT OF WEYERHAEUSER

The 500th Issue

of AIR CONDITIONING & REFRIGERATION NEWS
which will appear on OCT. 19, 1938 will be dedicated to the
promotion of the FIRST ALL-INDUSTRY REFRIGERATION
& AIR CONDITIONING EXHIBITION—the big show which
will be staged at the Stevens Hotel in Chicago, Jan. 16-19, 1939.

ONE of the most significant events in the history of refrigeration and air conditioning is scheduled to occur in Chicago next January. It will be the FIRST exhibition in which ALL branches of these closely-related industries will be invited to participate.

For years refrigeration men have asked the question: Why aren't all of the competitive makes, all of the new models, the latest designs and improvements in equipment, the new materials, parts, supplies, and accessories—why aren't all of these products displayed under one roof, at least once a year, where buyers may see what is available to meet their requirements.

Similar questions are asked by those who foresee the great future possibilities of air conditioning but who still find it difficult to get a clear mental picture of all of the types and styles of equipment and their practical application in home, office and factory.

The idea of such an exhibition has been in the making for a long time but it has remained for the Refrigeration Supplies and Parts Manufacturers' Association to take the lead in sponsoring a definite program for an organized visual demonstration of the industry's vast array of goods and services.

There have been refrigeration and air conditioning exhibits before... hundreds of them. Thousands of people have attended the displays of new models staged by individual manufacturers. There have been big exhibits of many makes and models of household refrigerators at demonstrations fostered by public utilities, newspapers, etc. Some industrial conventions, such as the dairy and ice cream shows, have been dominated by exhibits of commercial refrigeration equipment. Similarly refrigeration and air conditioning displays have been much in evidence

at shows promoted by various national and local organizations, but this will be the first one to be operated by a large group of manufacturers.

The 500th issue of the News will be designed for the special benefit of exhibitors who wish to make advance announcements about new products to be exhibited and to attract the largest possible number of customers and prospects to their displays in Chicago next January.

This celebration number of the News will provide an effective pre-view of the Exhibition and will focus attention upon those leaders of the industry who are sponsoring this first all-industry program to stimulate early buying and more intelligent planning for the aggressive development of the 1939 market.

The Oct. 19th issue will reach foreign buyers in time for them to plan their trips to coincide with the All-Industry Exhibition. The pre-view advertisements will be especially interesting to the buyers in all parts of the world who cannot attend, but who are actively searching for reliable products to meet the needs of their expanding markets.

Refrigeration Supply Jobbers, one of the most important groups which will be looking forward to detailed information regarding the Exhibition, will receive the Oct. 19th issue at an opportune time. They will be working on their new 1939 catalogues and will want to include those lines which are being adequately advertised. Jobbers are outspoken in their preference for products which are known to their customers through consistent advertising in the News.

AIR CONDITIONING & REFRIGERATION NEWS
 5229 Cass Avenue
 Detroit, Mich.

Commercial Refrigeration

Commercial Unit Salesman 'Educates' Grocers on 'Educating' Customers To Buy Dairy Items Displayed In Store

OAKLAND, Calif.—By showing the grocer that, because of the convenience angle, he can logically expect to sell more milk than can the dairy delivery company, S. F. Rock, sales manager for the refrigeration department at Ruud Heater Co. here, has greatly stimulated the demand for modern dairy products cases.

Like any other commercial refrigeration salesman, Mr. Rock frequently encounters among grocery store prospects the argument that they aren't interested in modernizing dairy products cases because of the narrow profit margin available on these items.

He promptly changes their ideas along those lines by pointing out that consumption of milk can actually be increased by educating customers to do their buying in the grocery store.

EASY TO 'RUN TO STORE'

"When a customer orders her milk from the dairy," he explains, "she plans her menus according to that standard order. Perhaps she's planned to make a pudding for evening dessert. If little Jimmie happened to drink an extra glass for breakfast, she won't have the milk for that pudding, and so she doesn't make it. But if she's used to buying her milk at the grocery store, she'll send little Jimmie down there for an extra quart, and go ahead with the pudding."

"It's all a case of buying habit. The customer who buys from the dairy is usually thinking in terms of the bill at the end of the month. Consequently she holds her daily order down as far as possible. But when she can buy a bottle for a few cents cash, she doesn't think anything about it."

"The grocer who has modern re-

frigeration facilities which make milk look attractive and appetizing can start many a customer who has formerly ordered from the dairy to buying milk from him. And once that habit is established, he'll find that his milk sales to her are constantly increasing. For the first few weeks, she'll probably continue the dairy buying habit and order only in small quantities. Then her orders will gradually start increasing in size.

"The main thing is to get her in the habit of buying milk from the grocery store. As long as she's a dairy customer, she's likely not to think of the possibility of buying extra milk from the grocery store when she needs it. That can be done only with modern equipment, attractive displays, good signs, and a certain amount of effort."

HOW HE HELPS GROCER

After he has succeeded in getting the grocer to install a modern display box, Mr. Rock follows up in helping him merchandise the goods carried in that case. He suggests arrangements of merchandise in the case which will produce related item sales. He helps the dealer work up attractive signs that will spotlight the line. He shows the clerks how to suggest dairy products. Within a few weeks' time, the store's sales have usually shown a decided increase.

The equipment Mr. Rock recommends depends on the individual store, but there's one thing he insists on wherever possible—that the merchandise be kept up at about eye-level height. That means use of a great many reach-in boxes.

For some years, Mr. Rock had been convinced that people bought more merchandise when it was at about eye-level than when it was displayed above that mark or below

15,643 Commercial Refrigeration Systems Sold In July To Distributors By 14 Manufacturers

The following report of commercial refrigerating and air-conditioning equipment sales for July, 1938 was made to the Commercial Refrigeration Section of the National Electrical

Manufacturers Association (Nema) by the following 14 companies: Brunner Mfg. Co., Carrier Corp., Crosley Radio Corp., Frigidaire Corp., General Electric Co., Gibson Electric Refrigerator Co., Kelvinator Div.

Nash-Kelvinator Corp., Merchant & Evans Co., Norge Div. Borg-Warner Corp., Servel, Inc., Uniflow Mfg. Co., Universal Cooler Corp., Westinghouse Electric & Mfg. Co., and York Ice Machinery Corp.

	Domestic		Canadian		Other Foreign		Total World	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
1. Bottle Water Coolers—Complete.....	460	\$ 28,468	8	\$ 516	26	\$ 1,906	494	\$ 30,890
2. Pressure Water Coolers—Complete.....	1,520	152,945	17	1,504	112	11,432	1,649	165,881
3. Water Coolers—Low Side Only.....	67	4,399	5	279	11	530	83	5,208
4. Ice Cream Cabinets—Complete.....	1,317	208,185	83	11,293	85	11,305	1,485	230,783
5. Ice Cream Holding Cabinets Only (Remote).....	164	21,764	5	582	3	441	172	22,787
6. Bottled Beverage Coolers—Complete.....	2,001	201,734	607	48,355	68	6,165	2,676	256,254
7. Beverage Coolers (No High Sides).....	73	8,429	.....	.....	44	2,417	117	10,846
8. Milk Coolers—Complete.....	102	10,815	.....	.....	2	153	104	10,968
9. Milk Cooling Cabinets (No High Sides).....	.....	.....	.....	.....	.....	.....	.....	.....
10. Self-Contained Air Conditioners Air Cooled—All Sizes.....	809	163,851	10	2,050	145	30,096	964	195,997
11. Self-Contained Air Conditioners Water Cooled—Under 2 Hp.....	135	26,415	2	550	10	2,373	147	29,338
12. Self-Contained Air Conditioners Water Cooled—2 Hp. and Up.....	312	171,811	3	1,800	22	13,200	337	186,811
13. Air Conditioners—Central Stations 5-Ton Capacity and Over.....	71	41,768	.....	.....	2	921	73	42,689
14. Air Conditioners—Floor Type (No High Sides).....	80	31,349	1	90	20	7,421	101	38,860
15. Air Conditioners—Ceiling (Cooling Only—No High Sides).....	178	23,332	2	523	23	3,198	203	27,053
16. Air Conditioners—Ceiling Type (Equipped for Heating—No High Sides).....	16	8,021	.....	.....	4	2,240	20	10,261
17. Air Conditioners—Residential Type (No High Sides, Boilers, or Furnaces).....	40	8,988	.....	.....	5	1,125	45	10,113
18. Condensing Units Less Than 1/2 Hp.....	1,493	75,405	120	6,686	274	15,937	1,887	98,028
19. Condensing Units—1/2 Hp.....	1,912	138,992	64	5,813	317	27,910	2,293	172,715
20. Condensing Units—3/4 Hp.....	1,106	114,683	49	5,515	159	18,291	1,314	138,489
21. Condensing Units—1 Hp.....	784	104,937	21	3,183	134	19,763	939	127,883
22. Condensing Units—1 1/2 Hp.....	386	61,174	19	3,550	53	9,517	458	74,241
23. Condensing Units—2 Hp.....	238	47,639	10	2,279	39	8,341	287	58,259
24. Condensing Units—3 Hp.....	121	27,830	10	2,132	15	4,091	146	34,063
25. Condensing Units—5 Hp.....	107	31,078	9	1,943	32	7,713	148	40,734
26. Condensing Units—7 1/2 Hp.....	96	42,312	1	562	12	5,275	109	48,120
27. Condensing Units—10 Hp.....	48	29,412	1	562	1	542	50	30,516
28. Condensing Units—15 Hp.....	45	36,434	.....	.....	9	5,471	54	41,905
29. Condensing Units—20 Hp.....	29	24,476	.....	.....	1	860	30	25,336
30. Condensing Units—25 Hp.....	12	13,991	.....	.....	2	2,217	14	16,208
31. Condensing Units—30 Hp.....	18	20,917	.....	.....	1	1,410	19	22,327
32. Condensing Units—40 Hp.....	12	17,343	.....	.....	.....	.....	12	17,343
33. Condensing Units—50 Hp.....	14	30,660	.....	.....	.....	.....	14	30,660
34. Condensing Units—60 Hp.....	11	26,173	.....	.....	2	3,800	13	29,973
35. Total—Lines 18 to 34 Inclusive.....	6,432	843,456	304	32,196	1,051	131,138	7,787	1,006,790
36. Total—Lines 1, 2, 4, 6, 8, 10, 11, 12, 35.....	13,088	.....	1,034	.....	1,521	.....	15,643	.....
37. Commercial Evaporators (Not Reported Above).....	2,208	78,865	319	9,407	496	19,622	3,023	107,894
38. Air-Conditioning Evaporators (Not Reported Above).....	142	25,909	.....	.....	6	700	148	26,609
39. Total Commercial & Air Conditioning.....	.....	\$2,060,504	.....	\$109,145	.....	\$246,383	.....	\$2,416,032

it. To get concrete evidence to back up the theory, he conducted an interesting test in an Oakland grocery.

One by one, he tested a variety of different canned and packaged goods items at various levels. From each 6-foot shelf section in the store, he selected one test article. That item was placed in three places in the section—in an eye-level height shelf, at a point several steps above that, and down near the floor. Average sales from the eye-level displays exceeded those from the displays above and below by more than 35%.

'EYE-LEVEL' PRINCIPLE

Having those facts, based on research is a well known local store, to work with, Mr. Rock has experienced no difficulty in selling merchants on the importance of the eye-level principle. He has applied that principle in many unusual ways—particularly as to locations of cases.

For instance, a two-case installation in a very small grocery store in East Oakland has increased this firm's milk sales by better than 50%. The small floor space made it impossible to place a single large reach-in box out in the center of the floor in the usual position. So two sections, each 5 feet long, were set up on either end of the checking stand.

The arrangement has worked out excellently. Whichever way the customer approaches the stand, it is convenient for her to buy dairy products. And the merchandise is at a spot where she can't help but see it and where suggestion by the clerks is usually simple. The box can be opened from both back and front so the customer can either wait on herself or ask for service.

RELATED-ITEM STORY

In this store, as in many others, Mr. Rock has shown the operator how to increase revenue from the new equipment through "related-item" displays. On top of each case are kept packaged cheeses. Inside, cottage cheese is shown right next to lettuce and small jars of mayonnaise—the various ingredients of salads. With the chocolate milk are suggested cookies. Even a few varieties of cold meat are shown.

Many dairy companies, Mr. Rock has found, are willing to work closely with the refrigeration people in selling grocers on the idea of improving their refrigeration. While these firms operate their own routes

and sell direct, they are also interested in the dealer business. Their principal aim is to sell more milk. If the grocer can increase their milk sales, they're happy to have him do it.

To the dealer who clings to the idea that he isn't much interested in milk, Mr. Rock explains the fact that it cannot only be made profitable on a volume basis, but that it also brings extra customers who buy other merchandise which carries a higher markup.

In this connection, an interesting experiment was made by a dairy company, which decided to find out how display cases affected milk sales. The figures showed that in several stores having old-type, no glass cases, the average turn-over was only two cases of milk a day. These merchants were induced to put in modern fixtures, after which average daily sales jumped to four cases.

The survey concluded that the average milk buyer's total check in the store was 50 cents. On the basis of two quarts to a customer, that increase from two cases to four might be taken to indicate that 24 extra customers were brought in. At a purchase of 50 cents each, that means a \$10 a day increase.

In any case, Mr. Rock's sales procedure indicates the importance of helping the prospect increase his sales with commercial refrigeration.

Midwest Mfg. Installs Self-Contained Jobs For Distributors

GALESBURG, Ill.—Low-cost installation of refrigerating units in self-contained type commercial cabinets has been announced as a new service to its customers by Midwest Mfg. Co. here.

J. C. Battles, manager, refrigeration sales, says he believes the plan is unique among manufacturers of commercial cabinets.

In connection with the installation work, the company is including free hot room testing of the assembled commercial refrigerators.

Under the new service plan, distributors are invited to ship units and valves, and temperature controls if used, prepaid to the Midwest factory.

Midwest will furnish tubing and fittings, install the refrigerating equipment in the cabinets, and re-ship the self-contained, ready-to-plug-in refrigerators to the distributors, or to their dealers, or direct to customers.

The net charge is \$10 a unit, provided, of course, that Midwest cabinets complete with coils, evaporators or blower coils are purchased.

BAKER backs you up with—

1. Most Complete Range of Sizes
2. Large National Advertising Campaign
3. Complete Factory Cooperation
4. More Than 30 Years' Experience
5. Precision Manufacture

6. Simple, Sturdy Design

For equipment that can "take it" year in and year out, choose BAKER units every time! Simple, sturdy design makes BAKER machines highly efficient and unusually long lived.

All working parts of BAKER units are designed to give maximum strength and resistance to wear and tear, with due consideration being given to ease of assembly and inspection of all internal parts where necessary. Such vital working parts as internal valves, bearings, piston pins, etc., are so designed that replacement is possible (after years of service) at minimum cost.

Note the streamlined symmetry of BAKER units, including the compressor, condenser and bases, made possible by selecting only materials of the highest quality known for the particular work to be done.

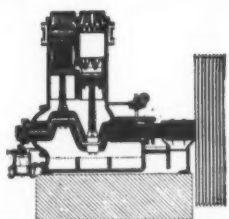
Over 30 years of manufacturing experience is incorporated in every BAKER unit, which assures to the owner the greatest possible economy in operation. That's why BAKER equipment is preferred throughout the United States and in 54 foreign countries.

For full details of the attractive BAKER franchise, write to

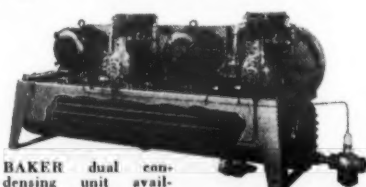
BAKER
ICE MACHINE CO., INC.
1506 Evans St., Omaha, Nebr.

Branch Factories: Fort Worth, Los Angeles, Seattle
Eastern Sales: New York Central Sales: Chicago
Sales and Service in All Principal Cities

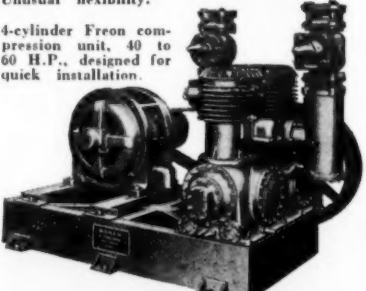
AUTHORITY ON MECHANICAL COOLING
FOR OVER 30 YEARS



Cut-away view of Baker compressor, showing the simple, sturdy design.



BAKER dual condensing unit, showing the streamlined symmetry.



4-cylinder Freon compression unit, showing the compact design.



EASY TO HOLD



ARTIC operates efficiently in compact, light weight units with low power consumption. It gives controlled low temperatures down to -10°F. at POSITIVE pressures. For dependable refrigeration, specify and use ARTIC.

ARTIC—THE PREFERRED METHYL CHLORIDE FOR THE SERVICE MAN

E. I. du Pont de Nemours & Co., Inc.
The R. & H. Chemicals Dept.
Wilmington, Del.
District Sales Offices: Baltimore, Boston, Charlotte, Chicago, Cleveland, Kansas City, Newark, New York, Philadelphia, Pittsburgh, San Francisco



Air Conditioning

New Way of Drying Air Is Developed By Davidson Co. of Miami

MIAMI, Fla.—First installation of a new type of air-conditioning system involving a different kind of air distribution and humidity control is to be made by Davidson & Co., Inc., local refrigeration engineering firm, in the company's new showroom being constructed at 1524 W. Flagler St. here.

The new type of air distribution and humidity control has been developed after six months' research work in Miami by W. J. McCoy, Jr., engineer of the Carbondale division of Worthington Pump & Machinery Corp., Harrison, N. J.

Davidson & Co. has Florida sales rights for the Worthington company.

Mr. McCoy came down from Harrison to Miami because excessive moisture in the air makes Miami a fertile field for air-conditioning research work, explained C. M. Davidson, head of the Davidson firm.

For six months Mr. McCoy conducted tests, experiments, and research work, declared Mr. Davidson, and the result is a new method for producing healthful, comfortable indoor temperatures.

Mr. Davidson said that he expects to expand distribution of the new system throughout the country, the Miami research being the basis of a general remodeling of air-conditioning equipment. An important principle of the new system, Mr. Davidson said, is a method of drying the air.

Kerotest Introduces New Angle Valves

PITTSBURGH—A new line of packed angle valves with wing seal caps for use in refrigerating units has been announced by Kerotest Mfg. Co. Corresponding with the Kerotest line of wing seal cap globe valves, the new angle valves are said to make it possible for an installation requiring large size globe and angle valves to be completely equipped with Kerotest Freon tested valves.

The new valves are in seven sizes, with OD solder connections of $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, and $\frac{7}{8}$ inches.

G-E Launches Conditioner Sales Drive In 60 Cities Aimed at Residential Jobs

BLOOMFIELD, N. J.—A 60-city sales drive on automatic heating in the East and the Middle West is being conducted by executives of General Electric Co.'s air-conditioning department, who are making a series of two-day visits in each of seven cities to analyze automatic heating business conditions in each territory and formulate plans accordingly for a four months' campaign for new business.

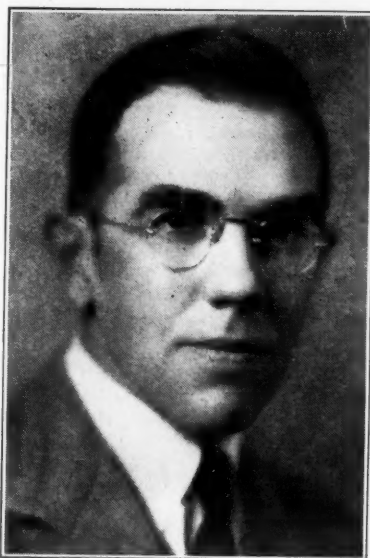
Heading the G-E contingent which is conducting the meetings in co-operation with distributors are A. E. Pierce, manager of the oil furnace division; H. C. Williams, manager of the gas furnace division; and Elliott Harrington, manager of the commercial engineering division.

The tour began on Aug. 22 with a two-day meeting in Chicago. Other two-day meetings, with distributor and dealer principals and sales staffs from a total of 60 key cities, were scheduled for Detroit, Cleveland, Albany, Boston, New York City, and Philadelphia, concluding meeting to be held in the latter city Sept. 10.

In a determined effort to create new business during the last four months of the year, the campaign will enlist all the engineering, sales, and promotional resources of the G-E organization working with dealers, distributors, builders, contractors, local FHA representatives, and allied agencies in the 60 key cities.

At the opening session in Chicago, Mr. Pierce declared that residential building is approaching the yearly

Sales Manager



HARRY W. EWALD

Auditorium Appoints Ewald To Head Sales

NEW YORK CITY—Harry W. Ewald was appointed sales manager of Auditorium Conditioning Corp. at a recent meeting of the board of directors.

Mr. Ewald has been active in sales promotional and managerial work with Duquesne Lighting Co., Pittsburgh; Philadelphia Electric Co., Philadelphia; and Electric Bond & Share Co., New York City.

He also has been manager of the Electric League of Pittsburgh, editor of commercial publications for Pennsylvania Electrical Association and American Gas Association, and member of the plan committee of Edison Electric Institute's kitchen modernization bureau, national water heating council, and national electric truck committee.

Mr. Ewald is a 1918 graduate in electrical engineering of Johns Hopkins university, and served as private and second lieutenant in the signal corps in the World War.

His early career includes several years with General Electric Co., during which time he operated an experimental automatic railway substation and was in charge of all automatic substation publicity.

Maintenance Official Praises Conditioning

CHICAGO — "Lower maintenance cost for cleaning and decorating completely offsets the operating cost of an air-conditioning system," says Fred B. Orr, assistant to the vice president of the Illinois Maintenance Co., writing in the Journal of Real Estate Management, official journal of the National Association of Real Estate Boards.

Where it is possible to balance the

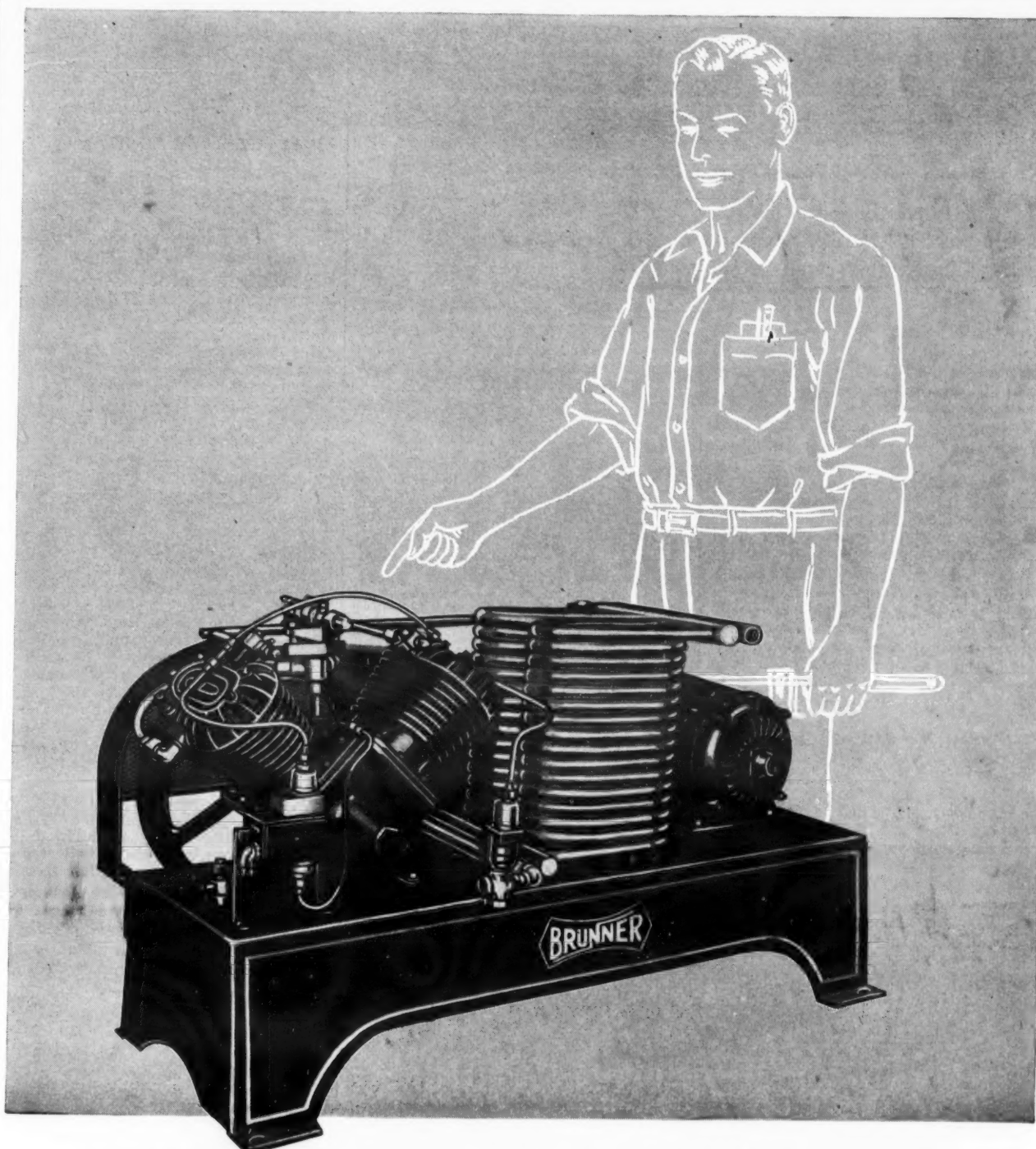
cost of air cleaning and humidity control against the savings effected over a period of 4 years in cleaning costs and furniture repair bills, the extended life of furnishings and equipment would return the investment if it were amortized over the life of the furnishings.

"Draperies, rugs, decorations, furniture, and furnishings would not only have a much longer life with conditioned air in the building, but would also keep their new appearance, and require less attention, cleaning, and laundering," Mr. Orr points out.

Conco-Sampsel Appoints 2 New Distributors For Stoker Line

MENDOTA, Ill.—Two new distributors for the Conco line of stokers have been appointed by Conco-Sampsel Stoker Corp. here, according to W. S. Michael, sales manager of the company.

New distributors are National Sheet Metal Co., Atlanta, and Heating & Cooling Corp., Montgomery, Ala.



CONTROL VALVES CONVENIENTLY "BUNCHED" FOR QUICK, EASY ADJUSTMENT

No neck-cranning necessary when you adjust the control valves on a Brunner! There they are "out in the open" where they can be readily seen and worked on... Another convenience on the new Brunner Condensing Units is the motor take-up arrangement, making this occasional adjustment very simple—a matter of seconds... From every angle—convenience, dependability and economy—Brunner refrigerating equipment is a wise choice for exacting commercial applications. With a wide range of units, air and water cooled, designed for any of the commonly used refrigerants, there's a Brunner Condensing Unit for practically every installation up to 15 tons of refrigeration. Get the detailed Brunner story... see what Brunner engineering and advanced manufacturing and testing methods have done to put mechanical refrigeration on an eminently dependable basis. Write: Brunner Manufacturing Company, Utica, N.Y., U. S. A.

IT'S **BRUNNER** FOR *economical* SERVICE

A. A. Berle's Study on Monopoly Explains What Measures May Be Needed To Enable Smaller Business To Compete

In the monopoly study now being made by the Temporary National Economic Committee, many leading business men see a genuine opportunity for industry to state its case and receive a more honest, fair appraisal at the tribunal of public opinion than it has been getting in recent years.

First report made to that committee is a study made by Undersecretary of State A. A. Berle, a report which has attracted considerable attention. Because of its keen penetration into the fundamentals of our industrial system, and because of its cogent observations on practical economics, this study deserves the attention of every business man.

As a service to the industry, the News reprints this classic study in full in this issue. Don't be afraid of its length—it reads like a fascinating detective story.

1. General Objectives

The investigation of business organization and practices (frequently called investigation of monopolies) should be essentially a search to find an organization of business that works.

1. Economic organization may be roughly tested by the following:

(a) Does it provide an adequate supply of goods as tested by the normal markets? As tested by the apparent needs?

(b) Does it provide a maximum number of people with an opportunity to make a living under this process—a life under this process—conceived as conditions under which people can live, maintain families, expect to continue, in the economic system and end this side of the relief line or the poor house?

(c) Does it accomplish this process with due regard for the liberty and self-development of the individual?

One result ought to be something in the nature of a triple income statement for the industrial system; the income statement being:

1. A statement of production—set against

(a) distribution
(b) need.

2. A statement of employment and wages, set against the number of people who may reasonably be entitled to expect to support themselves in the industry.

3. A commercial statement of profit and loss.

Such an approach will at least indicate the major successes or, more often, the failures resulting from the existing industrial system. At least, it will end certain illusions which now confuse national thinking.

We know in advance that the present productivity of industry, which is so highly regarded and so often praised, is not, in fact, sufficient to meet the aggregate of "legitimate claims" made against it by labor, by consumers, possibly also by investors, in many instances. But this fact is rarely appreciated.

2. Some Unwarranted Assumptions

All previous investigations of this kind have commonly commenced with a set of preconceptions. There is reason to believe that the present investigation may be in danger of doing the same thing. It is appropriate to note a few of them.

(a) Small Business Is Not Necessarily Competitive

There is a tendency to idealize the early nineteenth century and to assume that small business and the prices it charged were the result of competition.

As far as I am able to see, there is, little, if any, foundation for this. The village grocery store, the village blacksmith, the village grist mill, were all monopolies. Until the advent of the automobile, they charged conventional prices or administered prices which were not elastic. The people of the village could not go many miles to the next town.

In a large measure this is still true in small towns. Such competition as there has been, curiously enough, came from large-scale enterprise; mail-order houses, and later the chain stores.

The theory that prices were adjusted by competition under the old small-scale production in small towns, as far as I can see, simply never was generally true, despite some nostalgic reminiscences which are indulged in today.

(b) Small Business Is by No Means Necessarily Humane

There was actually competition on a wide scale in large centers between small business. But there is no point in idealizing this though, to some extent, it produced desirable results from the point of view of price and distribution.

The type of competition in small business is more nearly the New York "sweat shop" in the garment trade, and the elimination of the "sweat shop," as such, while it considerably improved the lot of the workers, has not produced units which stand out as monuments to a desirable social system.

Actually, high-speed competition by small units is as likely as not to produce, through sheer economic pressure, conditions that are undesirable, if not cruel; undesirable because there is constant attempt to meet the competition by depreciating the quality, as well as the price; cruel because labor, or the shop masters (who are, to all intents and purposes a section of the laboring class) are either exploited or forced to exploit themselves.

I am by no means clear that the existence of a large number of half-starved contracting garment shop owners (usually laborers who try to go it independently) may not be only slightly less anti-social than the old sweat shops. If the first was an open scandal, the second is certainly not pretty to look at.

Where there is no competition, the small-scale unit may or may not be a creditable piece of social machinery, depending entirely on the character of the men who run it.

Actually, the village monopolist, the exploiting grocery store owner, who was also the money-lender, is a perfectly familiar type. He must be set as a liability alongside of similar proprietors, who are assets to the community, in that they handle his store, their cash and their credit relations so as to try to develop the town and make a living easier for everyone.

The principal advantage of small business lay in the fact that public opinion, social pressure and the like, could be brought to bear on the small owner to the general advantage of the community. It cannot be brought to bear on the absentee owner, the chainstore proprietor, the mill owner, who is as dominant a factor in the community, et cetera.

(c) Efficiency of Size

There are two distinct preconceptions which cancel each other. One of them is that large-scale enterprise is more efficient; the second is that it is, by hypothesis, less efficient as it grows.

I see no reason for indulging either preconception. The only solid factor about it is that pointed out by Mr. Brandeis on many occasions, namely that a large-scale enterprise will frequently and easily outrun the moral and mental stature of the man or men who direct it.

Aside from that point, the fallacy lies in the undefined use of the word "efficiency." An enterprise large enough to mesh with the financial machinery, including the Stock Exchange and commercial banks, is certainly more efficient, so far as obtaining capital goes, than a small-scale enterprise.

This is true even if it is less effective technically. It may be in a better position to meet legitimate claims of labor (most labor union people seem to think so), though I am by no means clear that this is generally true.

As to straight technical or mechanical effectiveness, there is presumably an optimum size. No one knows in respect to any industry what this optimum size is. Further, the optimum size will change overnight with the development of a new

method or process or set of machinery.

The claimed effectiveness of a unit in finance or production may be completely neutralized, despite its ability to produce, if it is unable to bring its production toward a known demand.

The difficulty with this line of preconception is that a standard of approach has yet to be set. It is familiarly insisted that the old-fashioned farm was an inefficient unit. Yet, if, besides the assumed cost of production, there were taken into account the continuity of employment, the ability to use energies of adolescents and of old people, the ability to take care of sickness and give some scope for individual creation and the like, it might prove that, if the same factors were applied to a large-scale plant, the old-fashioned farm was one of the most effective units known.

Put differently, a highly efficient plant, according to modern ideas, may merely mean a plant which has succeeded in unloading the maximum possible amount of obligations on the community, to be handled socially. Perhaps it has passed on some of the advantages of this escape from obligation to the consumer in the form of price; leaving the State to collect the rest in the form of taxes.

(d) Efficiency in Meeting Need

The major argument in favor of large-scale industry has been that it did raise the standard of living, which, reduced to understandable terms, meant that it stimulated want for many goods and services, produced a great many goods and supplies and got those goods and supplies, on the whole, very widely distributed. I see no reason for indulging this preconception.

A clear distinction ought to be made between what people want and what they need. It is legitimate criticism of such studies as have been made by Stuart Chase that they take as a starting point, not what people want, but what an impartial commentator thinks they ought to want.

In New York, it is probably true that milk can be laid down at distributing stations, like chain stores, for seven cents a quart, but that, if it is delivered in bottles, the cost will not be less than 11 or 12 cents.

People ought to want seven-cent milk and be prepared to go around the corner every morning to get it. They actually do want it put on the doorstep.

It probably is true that, without advertising, people would not want the number of things they want today. It does not follow that the standard of living would diminish if they stopped wanting cigarettes or canned soups or cosmetics or a new car every two years.

The debate on this point really involves a philosophical assumption, namely, what is the "good life." That discussion started, or rather reached a high point, in the time of Socrates, and no one has resolved it yet.

Nevertheless, because discussions have to start somewhere, the only practicable method of handling an investigation of the industrial system today is to assume that people are entitled to want what they actually do want; and to define economic efficiency as giving people what they want.

Anything else involves deciding (and ultimately trying to tell people) what they ought to want, which becomes tyranny pure and simple.

Summarizing these observations, it seems to me that:

First, the general scope of the investigation ought to be a search for an organization of business that actually works;

Second, the standard must be whether it supplies the existing and developing wants of the people as they appear;

Third, that this involves the provision of an adequate supply of goods;

Fourth, and a distribution system that takes these goods toward known wants to the maximum degree possible;

Fifth, that the system must provide a maximum number of people with means of satisfying those wants through a contribution to the system;

Sixth, that the system must provide the people engaged in the process with a manner of life, which at least tends to satisfy a fair proportion of their wants;

Seventh, the system must evolve a method of organization that does not interfere unduly, actually, or potentially, with the liberty of the individual—i.e., that its controls must release more individuality than they suppress;

Eighth, that there is no need to assume that these tests will be met by any single system or any single standard of size or set of practices at any given point.

As a final point, I note that, whenever a situation appears, it is always

wise to attack it with the realization that there is a real reason for it.

Habits in a large country do not emerge by chance. The reason may not be a good reason or may have ceased to be valid. The habit may be a bad habit.

But there is always a reason, with which we may intellectually disagree, but which cannot be disregarded as a social force. More interruption of habits and social machinery means nothing unless an equivalent or better machinery is simultaneously provided or suggested.

1. Subsidy of Industry By The Government

The immediate problem to be dealt with is that of the relationship of government to business.

As a first step, there should be ascertained the precise contribution or subsidy which the government now makes to existing business.

It seems to me, accordingly, that a major and possible first subject of investigation ought to be the amount of subsidy which the Federal, and possibly the State Governments, directly or indirectly, make to industrial enterprise. In one aspect this is really a study of how much of the cost of production including in that figure the cost of maintaining the necessary labor and obtaining the necessary market, has been loaded off on the community by the enterprise. Without figures before me, it is, nevertheless, safe to say that the result will be little short of amazing.

Among the forms of subsidy there may be listed the following.

(1) Direct Subsidies

These include direct grants, such as those made to the merchant marine and to the airway lines. Included in direct subsidies must be taken payments made nominally for service, but actually for the purpose of establishing the industry. Mail subsidies are frequent in this connection.

(2) Indirect Subsidies

These represent the relief of enterprise from charges which otherwise would be paid. I believe that the peculiarly low rail rates granted to newspapers and to second-class material fairly comes in this class. Exemption from taxes, franking privileges, etc., should be included here.

(3) Government Orders

Technically government buying should not be classified as "aid" to business. Practically, however, it frequently works out this way. It would be interesting to know how much of industrial development depended on buying by the government for government purposes. For instance, how much of productivity of a company like Bethlehem Steel is used by the government for war or navy orders.

(4) Special Privileges Granted

In this connection shining examples are, of course, patent and trademark privileges.

With this must be bracketed government exclusive licenses, for instance, the kind of license the Federal Communications Commission grants to radio companies.

Great care has to be taken especially with Federal or State license investigation. For instance, the Federal Communications Commission has taken the view that a part of its business is to protect an existing communication facility from impairment by a competitive facility as in the famous case when a radio beam license between New York and Oslo was denied because there already was a cable communication.

Yet the Federal Commission nominally is merely created to keep order in the air. What legal right is there for the maintenance of cable monopolies by the Federal Communications Commission? The same applies to the denial of licenses to use short wave transmission in the United States, thereby assuring a continued monopoly to the A. T. and T.

(5) The State Field Ought Not to Be Overlooked

The use of certificates of public necessity have, in fact, resulted in the granting of monopoly licenses in certain kinds of businesses, notably utilities, bus lines, etc.

(6) Tariffs

This point needs no comment. Most industry enjoys tariff protection designed to give it immunity from a considerable degree of foreign competition. In some cases this goes farther and is designed not only to cut out direct competition, but competition from other commodities or goods. In many cases this is designed to prevent the consumers from buying products they do want so that they will be forced to buy products which they do not want.

(Continued on Page 9, Column 1)

WE HAVE

No "Yes Men"

FOR INSPECTORS



PENN PRECISION TESTS
INSURE DEPENDABLE
FIELD PERFORMANCE

● One "NO" from a Penn inspector sends a part . . . or an assembly . . . into the discard. At every step in production—scores of times on many Penn Controls—each part and each sub-assembly, as well as the finished control, must pass the critical eye of highly-trained inspectors equipped with testing instruments of laboratory accuracy.

Penn factory inspectors say "YES" only when rigid standards are fully met. These men never compromise with perfection. They know, from field experience, that it takes the most scientifically engineered parts, accurately assembled, to give new-

control performance year-after-year, on the tough job of day-after-day operation.

Such exacting quality standards constitute a profit and performance safeguard for manufacturers, installers and ultimate users of Penn Controls—on heating, refrigeration, air conditioning, pump, air compressor and miscellaneous applications. This is your guarantee of performance that permits accurate estimates of installed costs and insures continuous trouble-free operation.

Bring your automatic control problems to Penn Control Specialists. A consultation will not obligate you.

PENN ELECTRIC SWITCH CO., Dept. No. R-3, GOSHEN, INDIANA. In Canada, Powerlite Devices, Ltd., Penn Electric Switch Division, Toronto, Ontario. Branches, Factory Representatives and Distributors in all principal cities.

You can depend on

PENN BUILT CONTROLS

Buy
Bet
Gain
(Conti
(7) G
It
trend
enough
experie
prices
quota
the sys
enough
set it d
pletene
In th
is com
instanc
rates a
and m
quently
work o
the mo
fixed b
the ins
(8)
Here
should
This is
attitude
ernment
it has t
For i
ket wor
State a
exped pr
expansio
ments l
with the
industry
the aut
to a sa
short ti
There
such c
running
The co
example
governm
(9) Rel
If it
least as
plants,
a large
to be a
form or
can be
Relief
is a su
Motors,
annual
a year.
this abo
When th
men wh
wage go
If this
General
different
which C
the gov
will com
to learn
essential
escape fr
of it.
(10) Di
RF
The fo
exhausti
suggestion
think, we
tries an
through
Revert
would be
required
governm
licenses,
ment c
through
all of wh
degree to
present o
to the g
ent view
probably
2. Non
To B
The ai
termine
mechanis
the indu
(1
There s
the way
tem worl
credit in
investiga
It woul
panies h
credit, o
What d
the relat
the banks
size of th
success o
I am p

Buying Privileges & Better Labor Bargains Gained By Big Firms

(Continued from Page 8, Column 5)

(7) Government Protection of Price

It is not altogether clear whether trends in this field have yet gone far enough to make certain the utility of experimental investment. A great experience has been in effect in sugar prices through the operation of the quota prices; but it is not clear that the system has been in effect long enough to justify the time involved. I set it down here for the sake of completeness.

In the other fields, however, data is complete and worth doing. For instance, practically all insurance rates are closely regulated by law and minimum rates are quite frequently fixed. Since the public health work of the government diminishes the mortality and risk, the rate is fixed by a minimum. The effect on the insurance companies is material.

(8) Collateral Subsidies Not Readily Apparent

Here is a tremendous field which should be thoroughly opened up. This is peculiarly true in view of the attitude of some people that the government is so much overhead which it has to carry.

For instance, the automobile market would cease to exist if the local State and Federal governments stopped providing roads. Certainly the expansion of roads and road improvements has had to go hand in hand with the expansion of the automobile industry; when road expansion stops, the automobile industry will run into a saturation point within a very short time.

There are a considerable number of such cases of incidental subsidies running into extremely large amounts. The construction supply trade, for example, is a direct subsidy by the government housing program.

(9) Relief Is a Subsidy to Industry

If it be realized that labor is at least as necessary to production as plants, and that the maintenance of a large body of labor normally ought to be a charge on production in one form or another, only one conclusion can be drawn.

Relief to workers in time of lay off is a subsidy to industry. General Motors, for instance, pays an average annual wage of approximately \$1,100 a year. When plants are running full this about takes care of the worker. When the plants shut down or lay off, men who are unable to save on this wage go onto the relief rolls.

If this were classified as a cost of General Motors, there might be a different picture of the extent to which General Motors depended on the government for its profits. It will come as a shock to the public to learn that unemployment relief is essentially a subsidy; but I see no escape from the underlying economics of it.

(10) Direct Loans, as Through the RFC, FCC, and the Like

The foregoing is not intended as an exhaustive list, but merely as a set of suggestions. The desirable method, I think, would be to take certain industries and companies and go right through the whole list.

Reverting to the motor industry, it would be discovered that the industry required huge assistance from the government in the form of patents, licenses, monopoly grants, government orders, indirect subsidies through roads, relief and the like, all of which are costs in considerable degree to the motor industry as at present organized, but pushed off onto the government. A slightly different view of "private initiative" would probably emerge from such a picture.

2. Non-Government Privileges To Big and Small Business

The aim of this should be to determine the effect of certain private mechanisms on the development of the industrial structure.

(1) Short-Term Credit

There should be an investigation of the way the commercial banking system works in extending short term credit in each of the industries investigated.

It would be found that certain companies have access to short term credit, others do not.

What determines this? In part it is the relationship of management to the banks. In part it is the assets and size of the company. In part it is the success of the company.

I am prepared to think that there

is probably less discrimination in terms of size down to a certain point in the short term credit field than in the long term credit field noted hereafter, but certain discriminations will readily appear.

More importantly, it will appear that the larger the corporation, the less it relies on short term credit machinery, at least directly; though it frequently does so indirectly by pushing the burden of carrying inventory onto its agents or selling outlets.

One by-product of this will be a substantial revision of the classic theory that short term credit is created against the creation of goods, i.e., that production of goods involved expansion of deposits. This would be true under small-scale industry, when practically every producing unit went to the banks to expand production or stock.

Today, I am inclined to think that short term credit has, in large measure, ceased to be an agency of production and has become an agency of distribution. An instance is one important sub-division, financing of instalment buying, by which industry, instead of borrowing money itself, induces the purchaser to borrow money for it.

Another sub-division must be the improvement in the credit status by the mere process of becoming large-scale industry with access to the stock market. The small concern having tangible assets, if it wishes to borrow, must be limited more or less to those tangible assets, especially inventory and stock and trade.

A large concern, able to create large subsidiaries and to float the stock of those subsidiaries on the exchange, can borrow against fixed or capital assets represented by the stock of its subsidiaries. Further, the amount of credit it can command will be measured, not by asset value, but by the value of securities.

For instance, the Southern Pacific Railroad can command credit by pledging the stock of the Pacific Fruit Express. My distinct impression is that it can borrow a great deal more on the stock of the Pacific Fruit Express than it could if it endeavored to give its interest in the refrigerator cars as security.

(2) Long Term Credit-Capital

It is obvious, though not commonly noted, that in any given industry the large-scale unit has a huge preferential position in the matter of raising capital.

My belief is that this preferential is the greatest single factor in encouraging large-scale as against small-scale industry. Specifically, it would be found that there is almost no machinery by which any concern can enter the capital markets on decent terms to obtain capital of less than, say, \$3,000,000; and that ability to obtain that capital increases steadily and the cost diminishes as the size of the concern increases.

Again it is important to notice what happens when a concern graduates from the class of being a "private" or "family" enterprise and becomes a publicly financed stock exchange affair.

Directly its securities and particularly its stock gain admission to an exchange, there is a change in valuation. Physical assets are immobile as a basis for credit, save for a limited extent on first mortgage.

The valuation placed on these assets is not very far from a conservative physical valuation. But the stock representing those same assets, when listed on the exchange, will sell on an entirely different basis; the aggregate value of such stock is not infrequently six, eight, 10 or 15 or 20 times even the balance sheet asset value.

Since additional capital can be raised by the flotation of additional stock at or somewhere near market value, the result is to give to the large concern an ability to raise several times the amount of capital on the same assets which are available to the individually owned or family owned or closed concern.

To a less extent this is true of obligations or bonds issued by the corporation. These again are commonly measured, not by the underlying assets, but by the apparent earnings, which, indeed, must be the real source from which the interest and ultimate repayment of the bonds must be expected.

Naturally, therefore, publicly financed concerns have a ready avenue to much more capital and much cheaper capital than any smaller enterprise.

A factor must be noted. By the device of authorized or unissued stock and the existence of a market quotation a publicly financed corporation can virtually print its own currency for the direct purchase of other plants. The United States Steel Corp. purchased the Columbia plant on the Pacific Coast in this way.

It is a familiar practice to find the expansion of a corporation accom-

plished through the direct exchange of stock through new assets. Through the medium of holding companies, the same machinery can be still more effectively used.

(3) Buying Privileges

To a great or less extent the large unit is fostered by the use it can make of its mass buying power. To some extent this has been curtailed by the provisions of the Patman Act, but it is probably true that a considerable amount of privilege survives.

It does not, of course, follow that a lower price for a large or continuous order is necessarily wicked or even uneconomic. It may be literally true that the cost of dealing with a single customer is less than the cost of dealing with many customers; by consequence, that size and power to buy en masse is, therefore, more effective.

If so, however, it is worth discovering what happens to the supplier under these circumstances. It may well be that so-called "efficiency" is not a real saving, but consists of shoving the cost item of production from the back of the buyer to the back of the seller or by him onto the back of labor.

It would be interesting, for instance, to know whether the real profits of a chain-store corporation came from actual saving of waste or whether they came from the fact that, in place of many small shopkeepers, there are now a highly exploited group of so-called "store managers," on the distribution side and a highly exploited group of small suppliers on the production side.

(4) The Privileges Granted to Labor Unions

It is axiomatic among business men that a small business cannot

cope with a powerful labor union. A labor union can dictate, not only rates of pay—which presumably should be uniform—but the number of employees, which frequently will put a small concern out of business.

A large concern can meet labor demands, either because it can pass the cost on to the buyer, or because it can improve its methods and expand its machinery sufficiently to satisfy progressively demands for higher pay and more jobs through

increase of output and increase of productivity per man.

It is a familiarly known fact in large-scale business that, whatever pay scale is set, the business can, over a period of years, improve its methods so that the ratio of labor cost to the cost per unit of ultimate output remains the same. Small businesses frequently cannot do this.

In this connection, some consideration ought to be given toward the (Continued on Page 10, Column 1)



3 *old Sayings*
THAT ARE
ANSUL AXIOMS

Clean as a Whistle
Pure as Snow
Dry as Sahara

ANSUL CHEMICAL COMPANY • MARINETTE, WIS.

ANSUL SULPHUR DIOXIDE
METHYL CHLORIDE

THERE IS AN ANSUL DISTRIBUTOR NEAR YOU



YOU CAN DEPEND UPON WHAT IT SAYS!

TEXACO CAPELLA OILS ARE RECOMMENDED FOR THE LUBRICATION OF ELECTRIC REFRIGERATION AND AIR CONDITIONING COMPRESSORS, AND MEET THE SPECIFICATIONS OF THE LEADING BUILDERS. THEY HAVE SUB-ZERO POUR TEST (TABLE BELOW), HIGH DIELECTRIC STRENGTH, MAXIMUM CHEMICAL STABILITY, AND ARE REFINERY SEALED. CORRECT GRADE FOR SPECIFIC USE DEPENDS ON SIZE OF UNIT, TYPE OF COMPRESSOR AND REFRIGERANT. SEE CHART ON OTHER SIDE.

GRADE	VISCOSITY	POUR TEST
AA	75-85	-30° F.
A	95-105	-25° F.
B	150-162	-25° F.
C	192-200	-20° F.
D	300-324	-10° F.
E	485-515	-10° F.

TEXACO *Capella* OILS

You are invited to send for a copy of this latest Texaco booklet on the lubrication of refrigeration equipment. 56 pages of valuable information, well illustrated throughout. Write for your copy today... no obligation.

"DEMAND FOR TEXACO Capella Oils constantly increasing," reports leading wholesale refrigeration supply house. Users everywhere find these oils superior, give better, longer service, are extremely resistant to oxidation and sludging. Texaco Capella Oils pass the most exacting tests... and the 6 viscosity grades provide an oil to meet each manufacturer's specifications.

Call the nearest Texaco warehouse plant, or write The Texas Company, 135 East 42nd Street, New York City.

Effect of Business Size on Initiative Discussed By Berle

(Continued from Page 9, Column 5)

possibility of uniform labor schedules in competing industries. Naturally, if there are differential wage scales in competing industries, the industry having the lowest wage scale has an advantage.

The late Frank Taplin prepared charts at one time showing that differential wage scale between southern bituminous mines and northern bituminous mines inevitably put the northern mines at a hopeless disadvantage, with the result that bituminous coal traveled a thousand miles farther to supply Consolidated Gas Co. in New York, although the logical suppliers were the bituminous mines in the Ohio Valley region. Incidentally, it is probably due to this that the Norfolk and West Virginia roads were prosperous when most other railroads were unable to make ends meet.

It is possible that it would be found that labor contracts, which were non-uniform, were as dangerous as railroad rebates used to be in the olden days—that is, that it is as dangerous to allow discrimination to labor unions as to public service agencies.

(5) Rates for Power, et cetera

This subject ought to be dealt with in very much the same way as rates for labor or for large suppliers. It is very possible that there is a real saving when power is supplied in large quantity to one customer. On the other hand, this may not be true.

The point here simply is to discover whether or not large-scale or quasi monopolist development is due to real effectiveness, or to the fact that strategic position is increasingly weak as size diminishes. This examination ought to be started without preconception.

Save in the long term credit field, the case either way appears to be wholly unproved. Sharp distinction has to be made between private discrimination forced by mere mass, and actual discrimination arising out of lowest cost of large-scale transaction.

In the latter cases, the genesis of lower cost ought to be looked at so that it can be discovered whether or not such lower cost is not merely the forcing of cost back on to the laborer or community or a forcing of it on to the consumer.

3. Effects of Large or Small Business on Initiative and Product

It is frequently said that government interference stifles initiative, that *laissez faire* (which presumably would include the allowing of business to set up any norm of size it chose) tends to decrease initiative. We have no accurate information on it.

(1) Technical Improvements

For instance, the development of new inventions. At present a very large number of inventions are made in research laboratories of large corporations. We have no knowledge as to how many of them are used; and, of course, no guide at all as to what would happen were these inventions open to exploitation by any group other than the corporation developing them.

It would be interesting, accordingly,

to have some factual knowledge as to whether the net result of research laboratories is not to stifle inventions, once they are made, quite as much as to cause actual invention.

(2) The Development of New Uses And Fields

It already appears from the experience of the Tennessee Valley Authority that a very large untapped use for power could be developed by different forms of organization. Specifically, they organized cooperative associations to take care of the local marketing of electric current; and the Tennessee Valley Authority sells only to municipalities or to such cooperative associations.

Commercial enterprises are commonly obliged, not only not to do this, but to discourage this because they have to protect their other marketing outlets, such as marketing by middlemen and the like. A single-unit producer, who did not feel responsible for the whole system, conceivably might get farther than the large-scale enterprise.

(3) The Necessity of Protecting Capital Investment

One reason why individual initiative is almost always resisted in any business system lies in the fact that it can destroy the existing investment of capital—a new method, a new machine upsets all of the interests.

Labor will commonly resist the process almost as much as capital or the employers, though not always. The CIO did not resist the introduction of the rolling machine in the steel district, though inevitably the effect must be to throw out of work a great many steel employees, who will not be replaced through employment in the manufacture of rolling mill machinery.

Certainly the sugar refiners have consistently resisted the logical development in the sugar trade, which is the refining at the sugar mill in small units instead of transporting raw sugar to the United States for refining here.

(4) Geographic and Natural Advantage Effects

A large business can develop "blankets" (the famous one is the Pittsburgh-plus system) whereby a manufacturer in one part of the country has equal chance with a distant market with a nearer by manufacturer.

It has never been ascertained whether it makes for competition or monopoly. Conceivably every price "blanket" which an industry dominated by large units can lay down is to increase, rather than to decrease competition, since the alternative would be the erection of local plants.

Here the choice seems to be what kind of a system is really wanted. A monopoly is no less monopolistic because it is local. In fact, a local monopoly is likely to be more cut-throat from an economic point of view than a national monopoly though it does not have the same political threat.

The problem is whether a few large-scale competing units are socially more desirable than a relatively large number of small-scale monopolies dominating the lives of that particular district.

Much of the thinking today tends toward the feeling that local monopolies would be preferable; but a close study of the life of, say, West Virginia, compared to the life of, say, Detroit, Toledo, and Flint, might lead to a revision of the theory.

4. National Concentration of Power

I presume some attention will be given to the problem of the concentration of power. This ought not to be confused with concentration of property or ownership.

These are two different problems. I have not been able to get up any intellectual respect for books like Lundberg's "Sixty Families" (leaving aside the fact that it was extremely inaccurate) because property is one thing and power is another.

Concentration of power in New York or Boston has nothing whatever to do with the private fortunes of individuals. The Van Sweringens were no less powerful at the end of their lives, when they were bankrupt,

than they were in midstream, when they had between them a fortune worth on paper two or three hundred million.

A study of concentration of property interests and of income would be interesting, but probably would prove nothing except the existence of a property owning class.

By the time it was discovered that one hundred thousand individuals owned a considerable percentage of the national income, it would also be discovered that most of these individuals had very little to say about what actually was being done.

There may be strictly social reasons for having no individuals with large incomes, though I rather doubt this; but such reasons have little to do with industrial organizations. Powerful individuals in industry may have large incomes; or they may not. There is no particular connection between the two facts.

The methods of control are well known. The most obvious of them are listed here purely for convenience.

Ownership.

Joint ownership with others.

Ownership of voting stock.

Ownership of controlling voting minority.

Ownership of a special class of stock overweighed as to vote.

Pyramided holding corporations.

Interlocking directorates.

Interlocking marketing agreements.

Unity of financial group control.

Control through short-term credit.

Control through patent licenses and price restrictions.

Control through being a principal customer.

Control through monopoly of a necessary raw material, e.g., rayon.

No accurate definition of control has ever been made. It is impossible to describe the process. In a good many cases the results would be fantastic in the extreme.

I have a good working knowledge of how the firm of J. P. Morgan & Co., "controls" the Guaranty Trust Co., "controls" the Guaranty Trust Co. They have no legal control of any kind. There is nothing to prevent the board of directors from doing anything it pleases. Yet at various intervals in the life of the Guaranty Trust Co. it has been in difficulties and on each occasion it has applied to Morgan & Co. for assistance and got it. By consequence, they not un-naturally seek and generally, though not always, follow the advice of Morgan.

There is nothing necessarily vicious in this. It was frequently good advice from the strict banking point of view. Certainly it was good ethics in the 1921 incident. But it does create the problem of power. There is no way of changing that relationship unless and until some system of capital banking is evolved, whereby the Guaranty Trust Co. can look for help in time of trouble to someone other than the private interests.

I have observed that the concentration of power is more likely to come from unity of interest, than from any legal device. This seems almost beyond legal control. You cannot prevent men whose interests are about the same, and whose minds run along similar lines, from doing about the same thing at about the same time.

It seems to me that one important line of study is that of industrial geography. The Aluminum Co. has pre-empted certain great areas in the United States through its alliances with the power companies.

In this connection, let me say that it would be an assistance to the State Department if more were known about the alliance between that company and the Niagara-Hudson and that company and the Canadian power interests than is known today. We know the result well enough. No industry can buy power in the St. Lawrence area without making terms with that particular group.

Very much the same thing is true in the rayon industry. Here, there is practical control, through the control of the supply, over knitting and weaving of rayon. That, I understand, is one of the few country-wide "blankets," sharing distinction with the block booking in the movie industry, and, until recently, the "follow the leader" steel price.

There is even more importance in knowing why those things happen than that they happen. I think it

would be found that the real desire to monopolize the market, either directly or through alliances, is less an anxiety to make huge profits than a desire to be sure that the concern will continue to exist.

As to results, one might compare the steel industry with the highly competitive textile industry and, when the comparison is finished, ask whether the country would be materially better off if steel production were to follow the pattern of the textile mills.

For it must be considered that competition in large-scale industry does not produce results as it does in small-scale industry; that it does not drive the least efficient producer out of existence.

It drives the least efficient producer into bankruptcy, whereupon someone buys the enterprise for a song; he can charge a lower price because he has no fixed charges to pay his capital; he can then bankrupt the next most inefficient producer; et cetera.

Only when the entire industry has been bankrupt and competition is reduced to the basis of their operating profits does the condition arise in which any unit in the industry goes out of business.

The economic law of competition works, no doubt; but the time taken for it to work is so long that we have not completed any cycle of that process yet; though it is just beginning to be completed in the sugar production industry and perhaps in the textile industry.

My point is merely that it, by no means, follows that some concentration of power may not be desirable in certain industries. I am by no means clear that, in some situations, the controlled cartel may not liberate individuals in the industry a good deal more than uncontrolled competition.

5. Evaluation of the Job Done

My hope is that the investigation of each industry will wind up with an evaluation of the job done by that industry, rather than, as in the case of previous anti-trust investigations, an assumption that any particular form is or is not wicked.

As I see it, the real question is whether a good job is being done from all points of view. In the introductory note a suggestion was made as to a triple balance sheet which would serve as some test. More specific headings as to which one would like to have an estimate are these:

(a) The Amount of Employment

Wage-scale hourly and annual.
Regularity of employment.
Conditions of employment.

(b) The Output

Actually marketed.
Apparently needed.

(c) The Price

Price is merely a method of distribution.
How nearly does it work?

(d) The Waste in the Process of Production and Distribution

This last factor can be roughly measured by the direct costs (e.g., cost of the raw material and the direct cost of labor) set against the price to the consumer. Unless this difference shows up in terms of net paid out profits or accumulated surplus, it goes to individuals who lie between the producer and the consumer.

These individuals find their means of making a living through just this process. In a sense, waste is a form of taxation of the consumer for the benefit of a set of people in between, who have to be taken care of somehow; the elimination of waste means, of necessity, finding some useful form of outlet for the people displaced.

(e) The Profit or Loss

From a commercial point of view, the job is evaluated, at least partially, by profits or loss. The results of any audit of the entire industry are likely to be surprising.

It has been said that the oil industry, for instance, works at a net loss in any given year, though, of course, some units make very large profits.

In this aspect operating profits only are important; the distortion of them by the financial structure is a relatively minor element. The operating profits indicate what the financial structure could be or ought to be.

(f) Improvement of the Art

Any fair evaluation of any industrial process must include a study of the speed and soundness with which it has evolved. If it be assumed that there is virtue in improvement of the process, as such, that degree of improvement is worth noting.

I am not altogether clear that mere swift improvement is desirable in itself. Certainly it is not unless the results are promptly passed on to the consumer and all costs involved in it are taken care of.

For instance, the evolution of labor-saving machinery may lower the cost of production. It may also throw a great many people out of work. The cost of re-establishing the people thrown out is thrown off on the community; except as savings of men involved may be used up.

In this sense, as things now stand, much of the cost of the improvement of any art is paid for, not by the industry, but by other people financially least able to bear it.

The problem is whether it is socially more desirable to have rapidly developing technique in industry, irrespective of who is hurt in the process, or whether it is better to have a regulated technique.

Highly competitive development tends toward the first process, a cartelized form at least affords the possibility of the second.

(g) Life Created

I am unable to think of any audit of an industry without thinking of what happens to the people engaged in it.

The automobile industry is highly successful from the point of view of production. But the life history of an automobile worker might tell a wholly different story.

Certainly, without some general notion of what the industry does to its people, we have no method of appraising whether the industry is a good thing or a bad thing for the country as a whole—"good" and "bad" being determined by the general average of the health and happiness of the largest number of people.

6. Claims Against Industry

If the system in any industry is to be judged by its effects, some audit has to be made of the effects which apparently are desired. Another way of putting this is that some examination ought to be made of what the industry is expected to do.

There are four main claims which are being advanced:

(a) The Claim of the Consumer for The Product

This is a claim for all goods or supplies which may be needed. This is not limited merely to all goods and supplies which can be paid for commercially. A low price naturally increases the ability of goods and supplies to travel toward need; a higher price impedes this.

To this extent price is important: price is the method by which goods move from production toward need. It is, so far as I can see, the only reason why price has any importance at all. But there may be non-commercial ways of getting goods toward need, e.g., relief purchases, surplus commodity distribution, community use, et cetera, which in greater or less degree cut under the price system.

(b) The Claim of Labor

For continuous work at an adequate rate of pay, labor organizations are establishing their claim almost entirely in terms of hourly wage rates and hours of labor.

I think this is probably shortsighted; it would be more consonant with what they perhaps really want if the claim were advanced in terms of annual income and permanency of jobs, plus pensions and sick relief. Nevertheless, it ought to be possible to get some clear statement as to what the labor organizations really are steering for.

(c) The Claim of Capital for a Return

This is historic; it involves some idea of the reward or hope which has to be held out to induce investment of capital. Since most investment is at least partially risk-bearing, this would be interest plus a premium for risk.

(Concluded on Page 11, Column 1)

DEHYDRATED AND SEALED

LINDERME

SEAMLESS Copper TUBING

LINDERME TUBE COMPANY
CLEVELAND, OHIO, U.S.A.

You can sell more Copelands
because they're priced to sell!

Today's market is price-minded. Copeland's low price means "lower-down-payment and easier terms" and those are magic words! Get the facts about Copeland's extraordinary proposition. Write today!

Copeland Refrigeration Corporation
Sidney, Ohio

Every facility of Servel's vast factory is available to meet your refrigeration needs, whether large or small.

SERVEL

Write For Servel, Inc., Electric Refrigeration and Air Conditioning Division, Evansville, Ind.

Berle Says New Deal Imposes Rules Which May Lead To Abuse

(Concluded from Page 10, Column 5)

(d) The Claim of Management

This claim has never been stated and no one knows what it is. Management wants pay, of course, but it also wants prestige, power, et cetera. In a word, it wants very much what most politicians and people in government want.

One of the most important things that the investigation can do is to serve as a forum in which these various claims can be stated. If, industry by industry, there are certain sessions set aside at which each group can lay out what it expects the industry under investigation to do for it, we shall have brought the discussion measurably forward.

This would clear the air in the whole field of labor; likewise in the whole investment field; and it is possible we might even get some more or less rational ideas as to what is expected of an industry in dealing with the public.

The "public" would be represented generally by the immediate customers of the industry; at all events, I can think of no other way of getting an intelligent statement of position.

7. The Program

It is obvious that no memorandum could undertake to lay out a program in advance of the data. Certain observations may be worth consideration.

(1) Methods of Control Meaningless Unless an Objective Is Stated

Senator O'Mahoney has worked out an extremely interesting bill to license corporations. It has a variety of substitutes for federal incorporation, desired by many statesmen from President Taft on. This is a brilliant and apposite method of control.

But unless the reason for the control and the result to be achieved is accurately arrived at, it means very little.

The individual licensing corporations would be merely an economic dictator; we should merely replace a more or less management control by a more or less responsible political control unless very careful standards are laid down.

A fair criticism of the technique of the New Deal has been that it indulged shotgun imposition of regulation without adequate definition of standard. The possibility of recapture or perversion of an agency like the Securities and Exchange Commission, for example, gives pause for thought.

By consequence, before the problem of ultimate control is taken up, the purpose and design ought to be definitely worked out, so that the normal methods of enforcement can cover the great bulk of the area, leaving administrative processes to deal with the doubtful, the experimental, and the cloudy areas.

If the argument in this memorandum is accepted, the design of any control undertaken should be to:

- Provide more goods, better goods, and cheaper goods;
- To provide more jobs, better paying and steadier jobs;
- To provide continuous ready access to capital financing needed to create and maintain additional plant; to provide for the continued development of the arts.

This diverges from the newspaper approach.

Where a high degree of competition will accomplish the result, that should be the method used. Where a high degree of cartelization under suitable control will accomplish the result, that should be the method. Where quasi-public ownership produces the result, use that. The answers will be different in different fields.

(2) Control by Competition

Legislating competition (unless all previous experience is worthless) simply does not work out. The unit which has the greatest number of governmental privileges accompanied by the best access to the capital market, and the best access to markets and natural resources, will, of necessity, eventually either monopolize or dominate the field.

If really small-scale units are desired, the really effective procedure would be to take away corporate privileges of limited liability. Men who are asked to sign their own names to their own notes will usually be limited by the resulting risk.

I doubt if this possibility will be seriously considered. During the century in England (1720-1810), when

corporations were virtually forbidden, the system worked until the end, but from 1800 on the pressure toward large-scale enterprise became unbearable; and the "Bubble Act" had to be repealed.

Failing this, it is probably more effective to assist competition, rather than legislate the large unit out of existence. This involves working out a variety of expedients.

CAPITAL CREDIT BANKS AND A CAPITAL RESERVE SYSTEM

(a) Revised Methods of Capital Financing

It has already been noted that small industry does not have the same access to the capital market as does large industry. A small step in the right direction was made by the change of the rules of the Comptroller of Currency with reference to bank loans and investments; but this is too limited a step to have general effect.

A real system of capital credit banks is plainly indicated; a system which would have to be backed by a capital reserve bank (presumably, a division of the Federal Reserve Bank) able to create credit, and to join in contracting it when necessary. This calls for a separate study.

Until this is done it is mere waste of time to grouse about "Wall Street." The Wall Street banking system is doing exactly what one would expect it to do—no less and no more.

If anything real is to be accomplished along this line, the foundation has to be laid for a capital credit system that really works.

(b) Methods of Taxation

The country has been through two or three fights in connection with corporate taxation, one of them having to do with the undistributed surplus tax and another with its modification and attempt to repeal. A courageous investigation of the working of that tax would be worth doing, but (politics and predispositions aside) it is fairly clear how it will come out.

The undistributed surplus tax was put on under the theory that corporations today could be trusts for the perpetual accumulation—that is, could go on accumulating income and adding it to capital without limitation. This is true. Through compound interest a few corporations could eventually control the whole United States.

What was not realized was the fact that a high undistributed surplus tax, though it retarded growth of existing large corporations, gave them a perpetual franchise, not only to stay large, but to be the only large corporations in existence.

No small business could grow up to a point where it could give its larger competitors any real battle. In consequence, every small business was in danger far more than the large; and knew it; which was the real reason for the revolt and ultimate modification of the tax.

Arithmetically, there could be no other result. Failure to distinguish between investment and holding corporations on the one hand, and operating or producing companies on the other, in which the owner, though he might technically "own" the income, was devoting it to building up a producing unit, frequently in the hope of competing against larger units, made the tax necessarily inequitable.

Further, and still worse, the tax left it open to the large unit to increase the area of its influence through marketing agreements, trade alliances, and the like. Thus it did not even prevent the expansion it was designed to remedy. There was a blissful ignorance of the fact that a "small company" is not a matter of mathematics. A concern with a \$75,000 average income might be a large grocery store; but it would be a pitifully weak steel or automobile plant.

If it were really desired to create a set of competitive units, one of the simplest ways of doing so would be to allow an exemption from undistributed surplus taxes—or possibly even from competitive income tax—until the corporation reached a size equal to, say 25% of its largest competitor, provided the income were devoted to building plant or paying debts incurred for that purpose.

The reverse process, of making it impossible for any existing or future small concern to fight a winning battle with the larger concern, whose capital structure and access substantially are already controlled, obviously destroys more competition than it can further.

(c) Access to Technical Improvements

It is at least conceivable that equality of access to all technical improvements might be granted on standard terms. Every invention could be made available to everyone who desires to use it, provided the same royalty payment is made.

What was desired through the operation of patent laws was to encourage invention. To some extent, probably, the ability of the patentee to grant an exclusive license accomplishes this end; in theory, at least, he might sell the exclusive license, or secure commercial development of his patent more profitably if he could grant such an exclusive license.

But against this the fact that the exclusive licensee need fear no competition for a considerable period of time; also, that much, if not most, invention is made in corporate research laboratories.

(d) Non-Competitive Fields

There are fields, of course, in which competition does not work out. This is particularly true of transportation; in part also of power; and, in my view, is true of many natural resources, especially oil. Here the real choice is between regulated monopoly and government ownership. The analysis laid down by Prof. de Vitti di Marco in his "Public Finance" (Marghet translation) is, I think, the best in print.

Briefly, that analysis suggests that choice between government or quasi-public ownership and private monopoly turns entirely on the relative efficiency of the two forms of production in taking the product to the need.

Where the product is standard and uniform, where the inefficiencies of government ownership are not materially greater than the inefficiencies of monopoly, and where the greater actual use can be developed from public ownership, the public ownership is preferable.

There are other reasons for desiring certain fields within which government expenditures may result in direct production of wealth; but they need not be detailed here.

(3) Control by Regulation

In certain fields it will eventually become plain that either (1) there will be no real competition, or (2) competition cannot produce a balance.

It is customary in certain circles to become violently excited at mention of regulation, rather than competition. Much of this proceeds from a lack of ability to distinguish between different kinds of business, and rests on the assumption that competition will produce a balance.

The sound points of objection seem to be: Regulation is always inher-

ently dangerous; it is often unsound to have government boards making regulations, without assuming responsibility for the results.

The decay of the Interstate Commerce Commission is an admirable illustration. Regulation is always an attempt to generalize and I have yet to see a regulation, either of my own making or of any one else's that fitted the situation.

Finally, there is always the certainty that, at some stage in the history of a regulatory body, the regulations will be used for purposes which are either corrupt, political, or doctrinaire.

Any of these three may produce violent and extremely unhealthy results. A Harry Dougherty running the Securities and Exchange Commission, as at present constituted, or a Whitney running the Federal Reserve Bank, could create a series of interests which would take years to dislodge.

Public utility regulations of many states have turned out to be a means of sanctifying privileges, rather than of protecting the public.

The beneficial side of regulation is this: there are certain fields in which we are not prepared either for monopoly or for public ownership, yet when planning is essential to secure economy. Here it may well be that some sort of cartel formation or other organization of the industry is essential.

The fields in which this is true are likely to be these:

(a) Fields in which the unit of industry is inherently large. This is particularly true, for instance, of the steel industry; certain natural resource industries; the power industry.

(b) Fields where a planning of output is inherently necessary. This is true of motors, of oil, possibly also of copper. I am not yet clear about textiles.

For instance the motor industry in 1937 undertook largely to increase its output and sales. It did this at the cost of suspending much of its activities in 1938 and causing widespread distress in the Detroit and Ohio area. Had anyone of the companies undertaken unilaterally to limit its output, a competing company might—and probably would—have increased its output.

Had the four major companies entered an agreement to plan their output, they would have been liable to criminal indictment. Yet common

sense would indicate some planning of output in the motors field; just as it does in the mining of crude oil.

The market can be estimated; the need is approximately known; a mere senseless overstocking and shutting down accomplishes nothing.

(c) A third essential where the regulative or quasi cartel system might be appropriate is the dependence of a large number of people on a reasonably continuous, reasonably even flow of the product.

Against the obvious interest of the consumer and the theory (delighted in by economists) of an elastic price, there must be set a simple fact. You cannot gamble with the economic safety of a large district simply in the hope that the expansion of inventory will lead to a lower price, which in turn will lead to an expansion.

The expansion of industry may lead to a lower price but this in turn may lead to a spiral engendering the hope of further price cuts, which will stop activity for a period of time, during which an entire district is out of work and all economic processes suffer accordingly. Meanwhile the human suffering occasioned by the stoppage is extreme.

(4) Areas of Direct Production

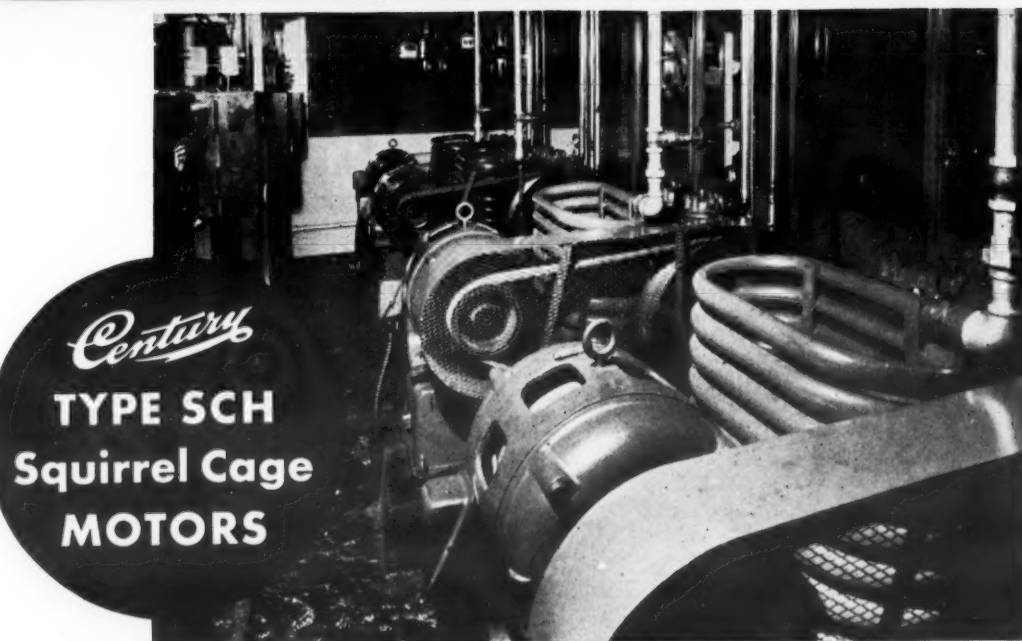
I am pretty clear in my own mind that, within 10 years, we shall be forced into a vast expansion of direct production of one sort or another; and that this is likely to be on a more or less regional basis, rather than on a strictly industrial basis. The Tennessee Valley Authority may very well prove to be the great example in this regard.

The advantages are obvious. Production without interruption because of annual fluctuations is possible; so is distribution without intervention of the usual cumbrous, wasteful marketing process.

Local government units, such as municipalities and towns, may be used to their full efficiency, cooperative associations giving full scope for local initiative may be developed; accessory activities of all kinds may be created.

My feeling is that the constructive side of the report will need to develop the areas in which all control forms, namely, competition, regulation, and direct production, are used. As stated above, there is no reason for assuming that any of the three is the sole answer for all industries, for any one industry, or for all localities.

Get ECONOMICAL PEAK PERFORMANCE from REFRIGERATION COMPRESSORS



4-15 H. P. Century Type SCH Motors, Driving Compressors for Air Conditioning a Large Department Store.

All the Torque Necessary to Start, Accelerate and Bring the Load up to Full Speed

The big problem in driving Refrigeration Compressors is Starting, Accelerating and Bringing the Load up to Full Speed—not only when the load is normal, but when operating conditions are unusual... when low-voltage reduces starting torque... when the compressor must be started at the point of maximum torque or when unlooked for mechanical or thermal stresses are imposed on the motor.

Thousands of users and manufacturers have met these problems with Century Type SCH Motors... They are built with the Torque Reserve necessary to start the load, accelerate it, and bring it up to speed without strain on the motor... Because of this you also save the cost of over-motoring.

They Start Quietly, without grunting or groaning—Run Quietly, without disturbing noises—Are Remarkably Free from Vibration that might "hammer" through pipe connections.

Make more satisfied customers with this unusual motor performance. 31 Century Branch Offices to serve you.

CENTURY ELECTRIC COMPANY
1806 Pine Street St. Louis, Mo.
Offices and Stock Points in Principal Cities

ONE OF THE LARGEST EXCLUSIVE MOTOR MANUFACTURERS IN THE WORLD



AIR CONDITIONING & REFRIGERATION NEWS

Trade Mark registered U. S. Patent Office;
Established 1926 and registered as
Electric Refrigeration News

Published Every Wednesday by
BUSINESS NEWS PUBLISHING CO.
5229 Cass Ave., Detroit, Mich.
Telephone Columbia 4242

Subscription Rates

U. S. and Possessions, Canada, and all
countries in the Pan-American Postal
Union: \$4.00 per year; 2 years for \$7.00.
All other foreign countries: \$6.00 per year.
Single copy price, 20 cents. Ten or more
copies, 15 cents each; 50 or more copies,
10 cents each. Send remittance with order.

F. M. COCKRELL, Publisher

GEORGE F. TAUBENECK, Editor
PHIL B. REDEKER, Managing Editor
THEODORE T. QUINN, Assistant Editor
ALFRED JONES, JAMES McCALLUM, and
HENRY KNOWLTON, Jr., Staff Reporters

R. T. CARRITHERS, Advertising Mgr.
HELEN K. GILMORE, Asst. Adv. Mgr.
JAMES B. SMITH, Asst. Adv. Mgr.

JOHN R. ADAMS, Business Manager
ROBERT P. NIXON, Asst. Business Mgr.
LOLA E. DEW, Subscription Manager

Member, Audit Bureau of Circulations
Member, Associated Business Papers

VOL. 25, No. 1, SERIAL No. 494
SEPTEMBER 7, 1938

Copyright, 1938, Business News Pub. Co.

Distorting the News Is Not The Answer

ONE of the finest fellows in the refrigeration industry is "Pete" Sampson, who has for many years been the hustling, successful Norge distributor in Chicago. And one of the chief reasons why so many people like and admire "Pete" is the fact that he isn't afraid to say what he thinks.

But, much as you've got to hand it to "Pete" for being a straight shooter and dealing his cards face up, he can't be right all the time. Not long ago, on the letterhead of the Sampson Electric Co., he wrote to his dealers as follows:

Headlines & Articles Depressing, Pessimistic

"Advertising is the life blood of the newspapers, and yet there never was a time any more than at present when the news sheets have to this extent detracted from the value of your advertising through the continuous printing of front-page headlines and news articles of a depressing and pessimistic nature. . . .

"It is true that the circulation of the public press is the reason for merchants using this media to get their message across, but it is not true that the newspapers' interests are best served by disseminating only what is startling by virtue of its being a calamity. Layoffs in the same factories reported time after time give the public an entirely mistaken idea of the situation. . . .

Should Advertisers Edit News Columns?

"Every Norge dealer, before placing another advertisement with his paper, should discuss this point thoroughly and insist that one or two items with an optimistic slant be placed on the front page and that similar items be sprinkled throughout the rest of the issue. . . .

"... We shall give our fullest support to our factory and their

advertising agency in their endeavor to bring into the newspapers, and particularly upon the front page, every possible news item which has to do with employment, re-employment, construction, improvement, betterment, increase in commodity and stock prices, optimistic reports on crops and anything else which may be of assistance in making the advertiser's dollar return itself, with something to spare."

Playing Up 'Good News' May Prove Boomerang

When an influential man—even so square a fellow as "Pete" Sampson—starts trying to rig the records, whether they be the newspapers or a financial statement, the result is apt to be disconcerting. There was, for example, the sea captain who discovered that the mate had frequently made the following entry in the ship's log:

"The captain was drunk today."

After berating the mate for recording such unfavorable news, the captain ordered him never to do it again. So next day the mate entered:

"The captain was sober today."

A murder is news because, comparatively speaking, it seldom happens. A baby giant panda, a young man kept alive in an iron lung, living quintuplets, transatlantic flights, foreign wars—all these are news because they are rare, unusual, strange. If reports of good business go into a category like that, then what will people think about the state of the nation?

Newspaper Should Not Mislead Its Readers

It's certainly easy to agree that a newspaper which prints only bad news has a morbid slant on life, and isn't giving a true picture of the world. On the other hand, a perpetual Pollyanna attitude insults the reader's intelligence, too.

Refrigerators and room coolers sell best in hot weather. If we were to follow Mr. Sampson's reasoning (i.e., that news reports should be designed to help advertisers sell goods), why not tinker with the weather forecasts?

Or, knowing the great psychological effect on a city's morale when its baseball team is winning, why not doctor up the box scores just to make everybody happy?

New York, with its tremendous Jewish population, would undoubtedly go on a mad spending spree if some paper would run the headline: "HITLER ASSASSINATED."

People Won't Read Propaganda Sheets

But how long could such a newspaper continue to be a good advertising medium? If the reader catches on—and it usually doesn't take long—to the fact that the paper is edited to sell goods for merchants rather than to tell readers the truth, he will cease being a reader.

No, "Pete," in real life stocks don't always go up, business enterprises don't always make a profit, men lose their jobs, and the hero doesn't always get the girl.

Readers know that, and instinctively place their confidence in a publication that tells them the bad news as well as the good. Not a

They'll Do It Every Time . . . By Jimmy Hatlo



morbid paper, mind you—just one which faces facts unflinchingly.

In days like these, "Pete," your dealers haven't time to help edit their local newspapers. They should be out ringing doorbells, making good news, instead of writing it.

LETTERS

Substitution for Augustus: Edward the Confessor

Dry-Zero Corp.
Merchandise Mart, Chicago, Ill.
Editor:

I thought your editorial on planned economy was excellent. However, instead of citing "for every Augustus there are three Neros" in substantiation of your thought that "benevolence seems inevitably followed by tyranny," I would put it: "For every Edward the Confessor there are three King Johns." There were more wars under Augustus than under Nero, and your point that dictatorships inevitably lead to war, is too true to be clouded by a poor example—for Augustus was a bit of a ruthless dictator himself.

In conjunction with your reasoning, it is imperative to note that over the years of this country's growth under personal freedom, human relations have steadily improved; education and opportunity for the thoughtful workers have increased; charitable obligations have become more widely recognized; and exploitation has dwindled.

HARVEY B. LANDSAY,
President

'Can't Hold Out Any Longer'

Sherer-Gillett Co.
1202 First Ave., Eau Claire, Wis.
Sirs:

Have been receiving your publication for some seven or eight years, while service manager of the Northern States Power Co. of Wisconsin, but since leaving that position and joining with the Sherer-Gillett Co., I have only been able to get hold of a copy now and then. I can't hold out any longer, so please enter my subscription.

DON W. WALTERS

Distributor Abroad Seeks 'Psychology' Book

Norge Division, Borg-Warner Corp.
670 E. Woodbridge, Detroit
Editor:

In your REFRIGERATION NEWS issue of April 13 you advertised a book published by Prof. Wendell White entitled "The Psychology of Dealing with People."

One of our distributors abroad has written us expressing his desire to purchase the above book. We will

therefore appreciate it if you will advise us as to its cost.

C. L. FOSSATI,
Assistant Export Manager
Answer: Prof. Wendell White's book, "The Psychology of Dealing with People," is priced at \$2.50 and is published by the Macmillan Co. of New York City.

Missed

Southern Wisconsin Refrigeration Service
Commercial Sales and Service
215 E. Milwaukee St., Janesville, Wis.
Sirs:

Enclosed please find my check for \$6.00 for which give me a year's subscription to the REFRIGERATION NEWS and a copy of the 1938 Refrigeration and Air Conditioning Directory.

I took the News about a year ago and never renewed my subscription. I sure miss it. I was formerly in Portage, Wis., until I moved here and started up my own business, just a short time ago.

HAROLD L. HILL

Article on Accounting 'Most Interesting'

Central Refrigeration Co., Inc.
Installation and Service on All Makes of Domestic and Commercial Refrigerators
85 West Post Rd., White Plains, N. Y.
Sirs:

We are enclosing herewith 20 cents in stamps for the May 4 issue of your News. This is the issue which has the article on accounting in it, which we found most interesting, but unfortunately mislaid.

W. D. UPJOHN

Thinks 'Every Service Man Should Have a Set'

10½ So. York St.
Wheeling, W. Va.

Sirs:

Enclosed you will find M.O. for \$2.00 for which please mail me your Refrigeration Master Service Manuals No. 1 and No. 4.

I just received in the mail today No. 2 and No. 3 and I want the other two to complete the set. I wish you would notify me if you add another number to this set.

I am a service man for Sears, Roebuck & Co. and think that every service man should have this complete set.

O. R. UNDERWOOD

Australian Visitor Now in New York

J. Russell Hancock (Australia)
Pty. Ltd.
Wingello House, Angel Place
Sydney, N.S.W., Australia
Editor:

Our chairman of directors, Mr. J. Russell Hancock, is visiting Canada and the United States for the purpose of contacting existing principals and arranging new connections.

We are commission representatives, and are interested in developing the Australian markets for manufacturers of: aircraft, automobiles and tractors, trailer equipment, refrigeration heating and air-conditioning con-

trols and equipment, electric domestic appliances, wringers for washing machines, power tools, garage and workshop equipment.

Our present American principals include: Thermoid Rubber Co., Weaver Mfg. Co., Red Seal Controller Co., Brunner Mfg. Co., Gray Co., Hinsdale Mfg. Co., David Coe, New York.

Our New Zealand associate, J. Russell Hancock, Ltd., Wellington, handles a large number of American lines. We bank with the Union Bank of Australia, Ltd., Pitt and Hunter Sts., Sydney.

Note: If Mr. Hancock's itinerary is carried out on schedule, he will be in New York on Sept. 10, and will stay there for some time thereafter, and will possibly call on suppliers throughout the eastern states. He should be addressed care of Thos. Cook & Sons, New York City.

J. RUSSELL HANCOCK (AUSTRALIA)
PTY. LTD.

Finds Manuals Well Worth the Price

415 Johnson Ave.
Lexington, Ky.

Sirs:

Inclosed find check of \$1.00. Please send me copy of Manual No. 2 Household Refrigeration Installation and Service.

I have received copy of Manual No. 1 and it sure is worth any serviceman's dollar. I will send you order for remainder of the service manuals later.

LESTER WELLS

Recommended

Cahn Electric Co., Inc.
Box 869, Shreveport, La.

Publisher:
Have recommended that this distributor and all of my others in the New Orleans territory subscribe to your publication.

RAY BARKER,
Carrier Corp.

27 W. Cranberry Ave.
West Hazleton, Pa.

Sirs:

Enclosed find \$3.00 for which send me the three manuals on household refrigeration which you have recently published. These manuals are recommended by Sears, Roebuck & Co. service department in Chicago. I would appreciate if you would rush these to me. I remain

Ed. J. SCHNEIDER,
Service Manager

1 Mildred St.
Hull, Mass.

Sirs:

Please find enclosed check for \$3.00 to cover the cost of your three Master Service Manuals on household refrigeration, as per offer contained in Sears, Roebuck's service manual of May, 1938.

P. F. STANTON

1219 Norfolk Ave.
Norfolk, Neb.

Sirs:

I have taken your paper for years, find a great deal of information that is valuable. Keep up the good work. Would like to see more data on late machines—all makes 1937-1938.

G. L. BLEICH

Survey Shows Where Refrigerators Were Bought and Their Age

NEW YORK CITY — Approximately 60% of the 53,124 homes covered in the "Home Inventory Survey" conducted last fall by Scripps-Howard newspapers in 16 cities reported ownership of a mechanical refrigerator, results of the study, which has just been made public, disclose.

Counting residences and apartments in which refrigeration equipment was furnished by the building owner, almost 64% of the number of families surveyed reported use of mechanical refrigeration in their dwellings.

Of the 53,124 homes surveyed, 31,724, or 59.7%, reported ownership of a mechanical refrigerator, and another 4.2% reported using mechanical refrigeration equipment furnished by the building owner, to bring the total to 63.9%. This compares with a total of 21.7% reporting use of ice refrigerators—19.5% being owners of the equipment and 2.2% using ice refrigerators furnished by the building owner.

Only 4,590 families, or 8.6% of the total, reported that they used no refrigeration equipment in their homes, and another 5.8% returned no answers to the survey questions on refrigeration.

An outgrowth of the "Pantry Shelf Survey" originated several years ago by the Cleveland Press the Home Inventory Survey, said to be one of the most complete studies of consumer buying preferences to be made in recent years, covers use of branded foodstuffs, cosmetics, toilet articles, radios, automobiles, auto equipment and accessories, and a long list of other products in addition to refrigeration equipment.

Results of the survey are thought to be particularly accurate regarding brand names and use of products, since all reports were filled out by the individuals being surveyed, rather than by hired census-takers. All reports made in the survey were distributed through parent-teacher and other local associations, and were filled out in the home, where

reference to product brands was convenient and easy.

In addition to use of mechanical refrigeration equipment, the survey in this section also covered point of purchase by store types, brand preferences, and the year in which the refrigerator was purchased.

SEVEN ABOVE AVERAGE

Table 1 shows reported ownership of mechanical refrigeration equipment. It will be noted that seven cities show home ownership records in advance of the average figure for the 16 cities. Highest in this respect was Cincinnati, with a reported 73.3%, with Washington, D. C. and Houston, Tex., in a tie for second with 69.4%.

Pittsburgh, with 68.9%, Birmingham, Ala., with 68.3%, and Akron, Ohio, with 67.8%, were other leaders in home mechanical refrigerator ownership.

Washington, D. C. led all cities in comparative amount of mechanical refrigeration equipment furnished by the building owner, with 13.7%. San Francisco, which showed the lowest home refrigerator ownership, 29.8%, was second high in landlord-furnished mechanical equipment, 9.7%.

Ice refrigeration had its most extensive use in Fort Worth, Tex., with 29.6%, and Evansville, Ind., with 29.2%, the survey shows. Lowest city in ice refrigerator home use was Washington, D. C., with 7.7%.

Radio and electrical appliance stores and department stores apparently staged a close struggle for domination as mechanical refrigeration sales outlets, according to the "point of purchase" reports in the survey, shown in Table 2. Department stores show a total of 22.5%

as compared with 25.6% for radio and electrical stores.

It appears likely, however, that the electrical stores' total might be swelled considerably by additions from the unclassified or "miscellaneous" store column, which shows a rather abnormal total of 44.8% for the 16 cities studied. Furniture stores accounted for but 7.1% of sales, according to the report, but this figure also might be augmented to a considerable degree from the "miscellaneous" column.

High point for purchases through radio and electrical appliance stores was reported in Evansville, Ind., where 50.4% of the owners surveyed said they had bought through these outlets. Toledo, with 38.0%, and Houston, Tex., with 42.5%, were other high cities in this classification.

DEPT. STORE SALES

Department store sales high was reached in Cleveland, where a reported 34.7% of total purchases reported were made through that outlet. San Francisco, with 32.0%, and Akron, Ohio, with 30.2%, were other high department store refrigeration sales centers.

Furniture stores led all retail outlets classified in Knoxville, Tenn., with a reported 29.9% of all sales covered by the survey there. San Diego, Calif. reported 20.9% sales through furniture stores, according to survey information.

Potential replacement market among mechanical refrigerator owners reporting in the 16-city survey is indicated by the fact that 47.2% of all the mechanical refrigerators reported owned were purchased in 1934 or before, as shown in Table 3.

Best year for sales of new equip-

ment, according to this report, was 1936, when 19.2% of the number of mechanical refrigerators in use at the time of the survey were purchased. Another good sales year was 1935, when 17.0% of the purchases were made, with 1937 only a shade behind, with 16.6% reported.

As reported in Table 3, 8.5% of the refrigerators used by families reporting in the survey were purchased in 1929 or earlier, indicating that at least that percentage of the total number of families are good prospects for new equipment at the present time. In at least four cities, the 1929-or-earlier user class approximates or exceeds the 10% mark. These cities are Washington, D. C., Columbus, Ohio, Pittsburgh, and Evansville, Ind.

As to the make of mechanical refrigerator now used, owners surveyed in the 16 cities reported the following totals:

Frigidaire	22.4
General Electric	18.6
Norge	8.6
Electrolux	8.2
Kelvinator	7.9
Westinghouse	7.9
Coldspot	7.4
Crosley	3.0
Grunow	2.6
Leonard	2.2
Stewart-Warner	1.0
Others	10.2

In the "others" total are included ownership among reporting families of Apex, Copeland, Hotpoint, Universal, Majestic, Gibson, Sperton, Montgomery-Ward, and Cyclops units.

Many "two-refrigerator" families were discovered in the survey, since 39,571 mechanical refrigerators were reported by the 31,724 owner families covered in the study.

Scripps-Howard Newspaper Tabulations

Chart 1—Homes Reporting Ownership of Mechanical Refrigeration

	Own Mechanical Refrigerators	Own Ice Refrigerators	Mech. Refrig. Furnished By Bldg. Owner	Ice Refrig. Furnished By Bldg. Owner	No Refrig. In Homes	No Answer To Refrig. Question
Total 16 Cities	59.7	19.5	4.2	2.2	8.6	5.8
Buffalo	56.2	24.8	1.4	1.9	11.4	4.3
Washington, D. C.	69.4	7.7	13.7	2.1	2.8	4.3
Pittsburgh	68.9	15.8	4.5	2.2	5.7	2.9
Akron, Ohio	67.8	21.2	1.1	1.9	4.5	3.5
Cleveland	53.6	26.2	2.6	2.7	7.0	7.5
Columbus, Ohio	52.9	25.9	2.5	2.1	6.1	10.5
Cincinnati	73.3	11.4	2.6	0.9	5.3	6.5
Toledo	62.7	22.5	1.8	1.8	6.9	4.3
Indianapolis	50.1	27.2	2.6	2.4	10.0	7.7
Evansville, Ind.	56.3	29.2	1.4	1.7	5.0	6.4
Knoxville, Tenn.	58.4	27.8	3.1	2.0	3.3	5.4
Birmingham, Ala.	68.3	19.9	3.0	1.2	2.8	4.8
Fort Worth, Tex.	56.5	29.6	2.2	3.1	2.8	5.8
Houston, Tex.	69.4	17.4	3.2	2.8	3.6	3.6
San Diego, Calif.	58.2	17.2	4.1	6.1	10.0	4.4
San Francisco	29.8	8.5	9.7	2.0	39.6	10.4

Chart 2—Mechanical Refrigerator Point of Purchase By Store Types

	Department Stores	Furniture Stores	Radio and Electrical Stores	Miscellaneous
Total 16 Cities	22.5	7.1	25.6	44.8
Buffalo, N. Y.	19.1	1.6	29.0	50.3
Washington, D. C.	26.1	5.2	16.3	52.4
Pittsburgh, Pa.	19.7	5.9	24.4	50.0
Akron, Ohio	30.2	3.9	26.6	39.3
Cleveland, Ohio	34.7	5.4	24.6	35.3
Columbus, Ohio	19.4	4.1	25.1	51.4
Cincinnati, Ohio	24.0	3.8	34.5	37.7
Toledo, Ohio	25.3	1.1	38.0	35.6
Indianapolis, Ind.	18.1	6.4	21.6	53.9
Evansville, Ind.	15.7	9.0	50.4	24.9
Knoxville, Tenn.	20.5	29.9	12.7	36.9
Birmingham, Ala.	13.3	8.8	20.9	57.0
Fort Worth, Tex.	26.7	9.3	22.5	41.5
Houston, Tex.	12.4	6.8	42.5	38.3
San Diego, Calif.	21.7	20.9	11.6	45.8
San Francisco, Calif.	32.0	12.8	5.4	49.8

Chart 3—Mechanical Refrigerator Sales By Year

Year Purchased	1937	1936	1935	1934	1933	1932	1931	1930	1929 or Earlier
Total 16 Cities	16.6	19.2	17.0	11.9	8.9	7.0	4.8	6.1	8.5
Buffalo	16.3	18.3	17.3	12.4	9.9	8.4	5.2	5.2	7.0
Washington, D. C.	11.4	14.3	16.1	12.5	10.4	10.3	7.7	7.4	9.9
Pittsburgh	14.6	16.4	13.3	11.6	9.7	8.3	6.3	8.2	11.6
Akron, Ohio	16.0	22.6	18.7	13.6	8.2	5.7	3.8	4.3	7.1
Cleveland	18.1	18.8	15.3	11.2	10.1	7.1	4.6	7.3	7.5
Columbus, Ohio	19.5	21.9	14.5	9.0	7.8	5.6	4.8	6.0	10.9
Cincinnati	14.6	18.0	18.0	13.4	9.0	6.3	4.6	7.3	8.8
Toledo	19.5	21.1	15.4	10.7	9.0	6.6	3.9	4.4	9.4
Indianapolis	19.5	19.0	16.8	11.8	7.8	6.6	4.3	5.5	8.7
Evansville, Ind.	19.2	17.7	15.0	11.1	10.5	4.6	4.1	6.6	11.2
Knoxville, Tenn.	16.3	21.2	21.0	10.8	7.6	5.4	2.8	6.0	8.9
Birmingham, Ala.	15.6	19.5	21.7	10.6	7.7	6.3	3.9	5.8	8.9
Fort Worth, Tex.	15.4	17.4	19.4	13.7	9.9	6.4	5.6	6.1	6.1
Houston, Tex.	18.5	22.7	19.0	14.1	8.5	6.1	3.3	3.4	4.4
San Diego, Calif.	20.5	22.6	18.4	11.3	5.3	7.4	4.2	4.1	6.2
San Francisco	23.4	28.3	17.4	8.6	8.6	4.9	3.8	2.9	4.8

Leonard

MAKERS OF FINE REFRIGERATORS SINCE 1881

BONDERIZING
Protects it
from **RUST**

FOR more than half a century, millions of discriminating women have chosen Leonard to solve their refrigeration problem.

In line with modern trends, Leonard includes food saving, step saving and money saving features, and houses the efficient mechanical equipment in a cabinet of advanced styling, with a brilliant, long-lived finish that adds beauty to any kitchen. A sales making combination!

And, of course, under that gleaming white finish is the protecting quality of Bonderizing. Bonderizing gives the finish greater stability. It seals the metal away from kitchen humidity, prevents chipping and affords protection from rust.

Bonderizing appeals to the thrifty buyer as a definite, money saving quality and provides the dealer with a powerful sales point.

PARKER RUST-PROOF COMPANY
2197 EAST MILWAUKEE AVE., DETROIT, MICH.

SEND FOR
THIS BOOK

A book showing what a salesman should know about Bonderizing is available on request.

PARKER
Processes CONQUER RUST
BONDERIZING • PARKERIZING

System For Big Store Arranged To Work In Proportion To Loads

By Henry Knowlton, Jr.

DETROIT—"Sam's Cut Rate" stores have become an excellent customer for air-conditioning equipment, according to H. C. LeVine, president of Atmospheric Control Corp., Carrier distributor here.

Over a three-year period "Sam's" has purchased a total of 345 tons of air-cooling equipment. Of this amount 145 tons serves four floors of Sam's Campus Martius store, and the remaining 200 tons has been installed in the original Sam's on Randolph St. and in the adjoining annex building.

Sam's Randolph annex is cooled by a 100-ton Carrier system, located in a penthouse on the roof of the building. Arrangement of the equipment is illustrated in the diagram on this page.

Two 50-ton Freon compressors are installed in series with three evaporative condensers, which supply Freon to a large bank of coils, also located in the penthouse.

The drawing shows the unusual compressor, condenser, and coil hook-up employed in this installation. Purpose of the arrangement is to get full value from one or two compressors in direct proportion to the load requirement of the building.

One of the compressors has a suction bypass on two of the four cylinders. This bypass is operated by a separate pressure switch, which automatically unloads two cylinders when the load requirements are light. The other compressor operates at full capacity at all times.

The effect of this arrangement is that 50%, 75%, or 100% of the compressor capacity is utilized in accordance with the load requirements.

When the thermostat, located in the return air duct of the air supply system, is satisfied, both compressors shut down.

A 3½-inch suction loop takes the place of the ordinary header. This line connects both compressors to both banks of coils in a manner that permits either compressor to service both banks of coils without forcing the gas around the loop to get to the compressor which is in operation. Thus either compressor may carry its proportionate share of the demand load placed on the coils.

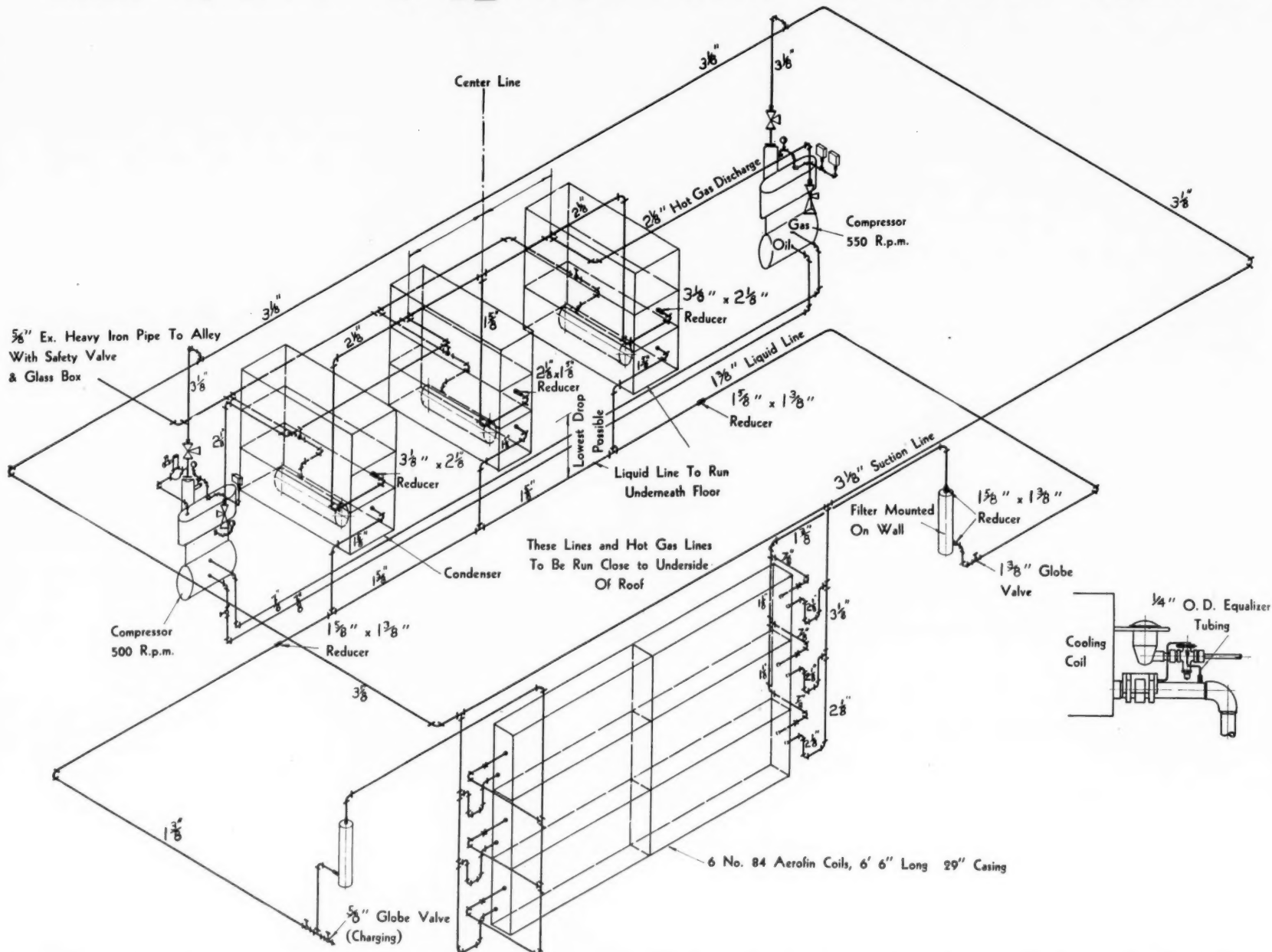
When the equipment is operating under full load, each compressor carries 50% of the total load. There is no possibility of a difference in pressure existing within the system, due to the loop shown in the diagram.

The liquid lines are also connected in a continuous circuit between the two compressors, three evaporative condensers, and the two banks of coils. This insures the equalization of pressure at all points in the system.

The two 50-ton compressors are connected below the oil line, to maintain an equal oil level in both compressors.

The compressor crankcases are also connected above the oil level to equalize the pressure.

'Closed' System of Piping Provides Flexible and Economical Operation



Two Carrier 50-hp. Freon compressors, installed with three evaporative condensers and two banks of coils in a penthouse on the roof of Sam's department store, provides conditioned air for the entire building. Note continuous suction and liquid lines connecting all parts of the system, which results in exceptional flexibility of operation.

Suction line connections to the coils are equipped with oil traps, and all coils are equipped with Carrier centrifugal headers.

Care was exercised in the design of the system to centralize the evaporative condensers between the two compressors, which were installed equidistant from the center line of the evaporative condensers shown at the top center of the diagram.

Each of the evaporative condensers handles 8,000 c.f.m., and the entire system uses only 6 gallons of water per minute. Economy of operation is demonstrated by the fact that it would be necessary to use 250 gallons of water per minute, which would have to be pumped from the basement of the building to the equipment located on the roof, if evaporative condensers had not been used.

Saving in water and pumping costs is evident, as the pump horsepower required to lift the water to the roof would have been approximately equal to the fan horsepower of the evaporative condensers, with the result that the water saved represents a net saving to the owners of the building.

Conditioned air created by the two banks of coils is distributed to the

four floors of the building by a 40,000 c.f.m. blower, which is equipped with a 40-hp. slip ring motor with variable speed controller.

The supply ducts are carried down through the roof of the building to the various floors where the air is distributed through 150 Carrier adjustable-type grilles.

Return air from all of the floors is taken through one stack leading from the first floor to the roof of the building, with intake grille opening at each floor.

Outside air enters the fan through the wall of the penthouse on the roof. Approximately 15,000 c.f.m. of outside air is used normally.

Takes on Space Heaters

DETROIT—Mechanical Heat & Cold, Inc. has been appointed southeastern Michigan distributor for the Superflame oil-burning space heaters manufactured by the Queen Stove Works, Inc., Albert Lea, Minn. The firm is Westinghouse air-conditioning distributor here.

Stokermatic Buys Murdock

SALT LAKE CITY—Announcement of the purchase of Gray & Murdock Mfg. Co. by the Stokermatic Co. has been made by Horace U. Siegel, general manager. Purpose of the move was to give the Stokermatic Co. its own manufacturing facilities, Mr. Siegel said.

Anaconda Copper Refrigeration Tubes

Unusually long lengths!

THE AMERICAN BRASS CO.
FRENCH SMALL TUBE BRANCH
General Offices: Waterbury, Conn.

'Coreco' Boiler Is Built With Novel Type of Combustion Chamber

BUFFALO, N. Y.—A new oil burning boiler for use with residential air-conditioning systems has recently been announced by Coreco, Inc. here.

The boiler differs in design from the conventional cast sectional or steel tubular boiler, and is described by the manufacturer as a "water agitated boiler."

Instead of a thermal vertical circulation of water within the boiler, the new boiler employs a separate combustion chamber section, within which steam is generated on flat surfaces exposed to the direct heat of the fire, from which section the steam passes through a port of small diameter to an upper, or steam liberating, section.

The intense steam generation in the combustion chamber section causes the steam to issue from the boiler in a series of rapid puffs, but without noise or priming, and with a steady water line, it is claimed. The principle of operation is said to result in a high rate of heat absorption per unit of heating surface.

The water boiler employs the same principle, and the generation of steam in the agitator section causes a pulsating action in the flow of water from the boiler, similar to the pumping action of a steam injector, the company asserts.

Exceptional efficiencies are claimed for the new unit, supported by test data issued by the Frost Research Laboratories.

SUPERIOR VALVE & FITTINGS CO.

500-37TH ST. PITTSBURGH, PENNA.

Manufacturing a complete line of DIAPHRAGM PACKLESS VALVES, MANIFOLDS, ACCESSORIES and FITTINGS for the Refrigeration and Air Conditioning Industry.

Styling and Mechanical Changes Made In Heaters

LANSING, Mich.—The Duo-Therm "Imperial," new fuel oil space heater manufactured by the Duo-Therm division of Motor Wheel Corp., was previewed by 250 members of the company's distributing organization at a convention here.

Designed by George Wilmet, the new heaters are lower and more compact, with smooth flowing lines which follow the modern trend in furniture, a golden fleck enamel finish, and a long bar-type brass handle on the door.

Mechanical features of the new heaters include a special waste stopper, which is said to reduce chimney waste and send more heat into the home; fully coordinated controls for proper draft on every oil setting; handy heat regulator, and the patented bias-baffle "Dual Chamber" burner.

In addition to the new unit, the Motor Wheel line includes a new "Thrifty" circulating heater, a new line of radiant heaters, cabin and trailer heaters, as well as oil-ranges, water heaters, and furnaces.

Advertising plans announced at the convention include the use of 15 national consumer magazines, in addition to an elaborate sales promotion and merchandising program.

Citizen's Coal Co. Handles Free-man Line

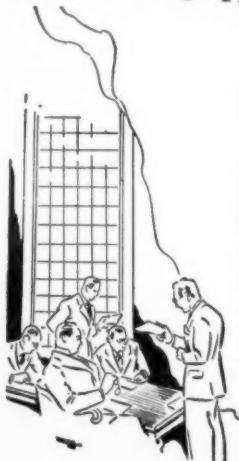
COLUMBUS, Ohio—Citizen's Coal Co., 401 W. Mound St., has been named dealer for the Free-man Automatic Coal Burner, manufactured by the Illinois Iron & Bolt Co., Chicago. The firm also distributes Airtemp air-conditioning equipment. S. Neal Hallock has been named manager of the stoker division, which has been established in separate quarters at 373 E. Broad St. Horton M. Bell is president.

SAVE 20-40%

Write for details of Alco's new Small Capacity "TK" Thermo Valve

Alco Valve Co. - St. Louis, Mo.

"WE CUT OUR SERVICE COSTS When we equipped with BRIDGEPORT BELLOWS"



This statement is typical of the enthusiastic reports we get from manufacturers who are now using Bridgeport Metallic Bellows in their controls.

If you have a problem in automatic controls, investigate Bridgeport Bellows. You'll find them more sensitive, more accurate, less subject to corrosion and usually less expensive than other types. They deliver the accurate, dependable, trouble-free service that contributes to consumer good-will.

Our engineering staff, specialists in the design and manufacture of metal bellows, will be glad to cooperate—on a strictly confidential basis—in designing the bellows which meets your specific requirements.

A booklet on Bridgeport Bellows is yours for the asking. Every engineer should have it. May we send it to you?

Bridgeport knows BELLOWS

BRIDGEPORT THERMOSTAT COMPANY, INC., Bridgeport, Conn.

5-251 General Motors Bldg., Detroit, Michigan 30 North La Salle Street, Chicago, Illinois

Air Conditioning

Air-Conditioning Engineers and Dealers Should Consult With Physician When Units Are Used In Hay Fever Cases

This article has been written for the NEWS by Dr. Young, who is the medical director of a completely air-conditioned hospital (most hospitals have only operating rooms or nurseries air conditioned, but Corey Hill has all rooms in which patients may be placed air conditioned). Dr. Young is the author of a recent report to the American Medical Association on how air conditioning reduces post-operative pneumonia.

Taking his undergraduate work at Colorado Agricultural College, Dr. Young received the degree of Doctor of Philosophy (in pharmacology and physiological chemistry) from the University of Wisconsin in 1924, and his Doctor of Medicine degree from the Harvard Medical School in 1928. He taught at Colorado, Wisconsin, and Michigan universities, was a research fellow in medicine at Thorndike Memorial Laboratory for two years, was on the medical staff of Boston Dispensary from 1930 to 1932, was instructor at Tufts Medical School in 1931 and 1932, was assistant professor of therapeutics at Boston university from 1933 to 1937, when he became a member of the staff of Evans Memorial Hospital, which position he left to take his present post.

This article, the editors believe, is an example of the type of mutual assistance which the air-conditioning industry and the medical profession can give each other. Dr. Young has promised to write more articles dealing with the medical profession's findings on air conditioning's relation to good health.

By Albert G. Young, Ph.D., M. D., Medical Director,
Corey Hill Hospital, Brookline, Mass.

AIR conditioning has proven to be a very satisfactory method for the relief of hay fever and asthma when properly applied; but unfortunately it is not always properly applied and a dismal failure results.

Air conditioning is a young industry and cannot afford to have disappointed customers. The hay fever and asthma patients suffer so severely and have been put to so much expense previously that they cannot afford to be disappointed.

For these reasons it is necessary for the engineer and the physician to pool their knowledge so that successful results may be obtained. If you have a customer who wants his room air conditioned because he has an allergic disease (asthma, hay fever, allergic dermatitis, etc.), your first question should be: "Who is your Doctor?"

Your prospects of a successful installation will be enhanced 100% if you will work with an intelligent physician. The reasons are simple.

The intelligent physician can tell you whether the patient is most sensitive to out-door allergens (pollens, dust, etc.), or to indoor allergens which are too numerous to mention. If pollen or other out-door allergens are the chief malefactors the air conditioning should be installed so that the air intake is located in the hall rather than the window, regardless of the efficiency of the filters.

No filter is 100% efficient and many of the severely afflicted patients are sensitive to infinitesimal amounts of pollen or other allergens.

If a patient is sensitive to indoor allergens the air intake should be from the window and here again the physician is a help. Most patients are sensitive to more than one allergen, so the engineer must first know what are the chief offenders and their source.

Where in-door allergens are the chief cause it is important to inspect the room carefully to make certain that none of the contents contain allergens since circulating the air

in such a room will only add to the patient's misery. Mattresses of washed horse hair with allergen proof casings are a help.

Beware of oriental rugs because of wool, camel's hair, etc. The best rug is a cotton washable rug. Pillows must also be carefully scrutinized. Other members of the family should be "cordially invited to stay out" of the patient's room since their clothes as well as their faces (especially women) often carry allergens.

Face powder, perfumes, and hair dyes are common allergens. The room should be cleansed by using a damp mop or an oil mop. Remember every effort should be made to avoid generating dust.

Woolen blankets and comforters are frequently "taboo." If the room temperature is properly maintained cotton blankets are sufficient. Do not hesitate to seal the window cracks with adhesive tape—it is an inexpensive way to stop leakage. Only one door should be available to the rest of the house and this should be a tight-fitting door with a spring that will insure its closure.

If the air pressure in the room is maintained slightly above that in the rest of the house you will be quite certain that offending allergens will be blown out rather than in.

I believe another safeguard is to put a nail or screw into the window so that it cannot be opened by some well meaning relative when the patient is not about.

The physician will help you to convince the family that flowers, canary feathers, or the family cat should be excluded from the house as well as the room. From the above statements it is obvious that the patient's room should be a special problem.

Air conditioning the entire house probably will not especially benefit the patient because so many allergens are present in the average home.

However, if the house is air conditioned, special treatment to the patient's room will be less expensive. Do not let a customer who has an allergic disease become discouraged because he has air conditioned his entire house and is still not benefited. Some special attention to his room will turn failure into success.

If the patient is sensitive to both out-door and in-door allergens, you must attempt to eliminate pollens from the near vicinity of the air intake. If he is sensitive to rag weed, grass, pollens, etc., a second story room is best for him. In case of extreme sensitization an air washer may be necessary.

Just one more place where the physician can help. If the patient's allergy is due to a food sensitivity he does not need air conditioning, he needs a diet!

Carrier Planning For Issue of Debentures

(Concluded from Page 1, Column 4)
of \$1.00 par value common stock. Some of the extra shares will probably be required for the reservation of common stock to satisfy the conversion privileges of the debentures, as the unissued and treasury shares now available for conversion will doubtless not be sufficient, the directors state.

The remaining shares, whose authorization the directors recommend as advantageous at the time of this special meeting, are for further needs of the corporation.

The change from no-par value to par value of \$1.00 per share will, of course, not affect the relative equities of any stockholders, but will result in a saving of stock transfer taxes for the stockholders as well as other taxes for the corporation.

As a result of the change of shares from no-par value to the par value of \$1.00 per share, there will be in the capital account an excess of \$4,858,086.06 over the then par value of the stock, which amount, after the necessary action by stockholders and filing the necessary certificates in Delaware, will be carried to capital surplus.

According to the plan being submitted, this will enable the corporation to charge against capital surplus the net deficit that has accumulated and which, subject to verification by audit, stood on the books at \$952,138.17 on July 31 of this year. It is anticipated by the directors

'High Speed' Treatment For Hay Fever Involves Use of Air Conditioning

BOSTON—A streamlined method of treating hay fever sufferers, which telescopes the usual period of treatment from six months down to 10 days, was described here Thursday night, Sept. 1, by Dr. Ethan Allan Brown, director of allergy research for the Corey Hill hospital in Brookline, Mass., and chief of the allergy department at the New England Medical Center.

Speaking to the Air Conditioning Bureau of Boston, Dr. Brown told how he has combined the two best known methods of hay fever relief—medical injection and air conditioning, neither of which is permanent by itself—into a technique which surpasses either in bringing more speedy and certain relief.

Described as the "rush treatment," it consists of giving patients injections once, twice, or even three times a day in an air-conditioned hospital, rather than once a week for a period of six months as was done heretofore without air conditioning.

"This enables the patient to leave the hospital during the ragweed season, and yet keeps him comparatively free of symptoms," Dr. Brown

said. "The level of immunity is then high, and can be controlled by injections given every three weeks or every month during the rest of the year without returning to the hospital. It is not necessary for the patient to return to the hospital the following year, nor is it necessary for most patients to have further injections."

Corey Hill hospital, where Dr. Brown's discovery was made, is the only hospital in the world which has complete year-around air conditioning, with all bedrooms, operating rooms, solariums, and corridors controlled in air temperature, humidity, and purity. He characterized the air-conditioned hospital as the greatest advance in 10 years for the treatment of allergic diseases, including pollen asthma, rose fever, and hay fever.

At its height right now, the hay fever season arrives about Aug. 15 when pollens of ragweed, Johnson Grass, pigweed, western water hemp, and other grasses start to permeate the air, and lasts until the first hard frost. Dr. Brown says it is never too late in the season for the "rush treatment."

financial program outlined in the notice has been approved by the stockholders and the debentures have been registered under the Securities Act of 1933.

Since this procedure will take at least until early October, it is naturally impossible to fix definitely at the present all terms of the issue.

Howard P. Ingels, partner in the firm of Munds, Winslow & Potter, and Clifford Hemphill, partner in the firm of Hemphill, Noyes & Co., have resigned as directors. E. C. Wampler, president of Stern, Wampler & Co., Inc., has resigned as director and member of the executive committee.

Herbert E. Smith, vice president of the U. S. Rubber Co., Fred F. Hoyt, comptroller of Carrier Corp., and M. E. Snyder, treasurer of Carrier Corp., have been elected to fill these vacancies. This leaves unfilled only the vacancy caused by the resignation of Bayard F. Pope, chairman of the board of The Marine Midland Corp.

... CONTROL



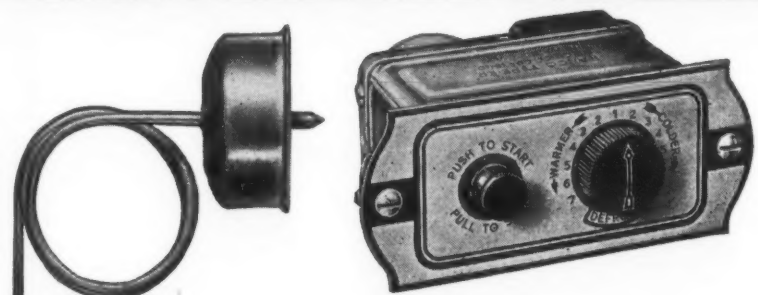
ACME

Picking up a handkerchief with his wing tip—only extreme accuracy resulting from years of experience makes stunts like this successful. Skill and precision also play a key part in the production of Virginia Quality Refrigerants. Unusual care in manufacture, with a "third-degree" final check for purity in terms of millionths of an ounce guarantee an extra-dependable refrigerant with an unvarying boiling point.

Wherever you are, Virginia Smelting Company's World-Wide distribution network brings this Quality to you promptly, efficiently.

EXTRA DRY ESOTOO • V-METH-L
VIRGINIA SMELTING COMPANY
WEST NORFOLK, VIRGINIA

A Good Bellows is the Heart of a Good Control



You Get the Life Insurance of SYLPHON BELLOWS in RANCOSTAT

Alert, responsive, dependable operation and long life—17 times longer life than with ordinary diaphragms, by actual test.* This is the type of maintenance-free performance Sylphon Bellows assures you when you buy Rancostat.

Reason why many leaders in the Refrigeration and Air Conditioning Industry, who have the greatest investment in product acceptance and good will, insist on nothing less than the time-tested superiority of Sylphon Bellows. Why you should look for this mark of quality in the products you buy—and offer in the equipment you sell. Write for bulletin RO-121. Sent on request.

*Unbiased test made independently by one of our customers in his own plant laboratory. (Borne out by our research and 35 years of practical field experience.)

The Fulton Sylphon Co.
KNOXVILLE, TENNESSEE

Representatives in All Principal Cities in U. S. A. and in Montreal, Canada and London, England

Text of Proposed Detroit Refrigeration Ordinance

Regulations Planned To Govern Installation Of Refrigerating & Air-Conditioning Jobs

REFRIGERATION CODE OF THE CITY OF DETROIT

An ORDINANCE regulating the design, construction, installation and maintenance of all refrigerating systems and the appurtenances thereof in the City of Detroit, Michigan; defining the power and duties of the Department of Buildings and Safety Engineering in relation to design, construction, installation and maintenance of all refrigerating systems; regulating the construction of ducts and the construction and use of devices required therewith in the distribution of air in conjunction with refrigerating systems; providing a penalty for the violation thereof and repealing all former ordinances and amendments thereto conflicting therewith.

IT IS HEREBY ORDAINED BY THE PEOPLE OF THE CITY OF DETROIT:

Section 1—Administrative

1.05: This ordinance shall apply to all new refrigerating systems and to parts of present systems repaired, replaced, or added to subsequent to its adoption.

1.1: No person, firm or corporation shall install or contract to install, alter or service any refrigerant containing part of any refrigerating system in the City of Detroit, without first securing a license therefor from the Mayor of the City of Detroit except as herein provided.

The license to install, alter and service refrigerating systems shall be issued by the Mayor upon the recommendation of the Commissioner of the Department of Buildings and Safety Engineering when a fee established by the Board of Rules of the Department of Buildings and Safety Engineering has been paid and a duly executed bond in the Sum of One Thousand (\$1,000.00) Dollars running to the City of Detroit for the faithful observance of the provision of this Ordinance has been filed with the Department. Such bond shall be a personal bond with two sureties, or one from a recognized

and approved surety company acceptable to and approved by the Corporation Counsel of the City of Detroit.

All such licenses shall be renewed annually and shall be revocable by the Mayor upon recommendation by the Commissioner.

Causes for revocation of licenses shall be gross incompetence, gross neglect, deliberate misrepresentation or wilful failure to comply with the requirements of this Ordinance.

A license shall be classified and limited as to definite refrigerants and types of refrigerating systems with which the applicant is familiar in the installation or servicing, and the applicant shall be licensed for that particular refrigerant or refrigerants and types of systems; provided, however, any person, firm or corporation may make application for and receive a license to engage in the installation and servicing of all types of refrigerating systems containing any, or all, approved refrigerants.

No license shall be issued until the applicant has shown to the Department by sworn affidavit that he, or it, has been actively engaged in the installation or servicing, or both, of refrigerating systems for a period of at least three (3) years, or has, in his regular employ and actively in charge a person who has been previously engaged in the installation or servicing of refrigerating systems for a period of at least three (3) years, provided that credit for one (1) year of actual experience in the installation or servicing of refrigerating systems shall be extended to any applicant who shows on the sworn affidavit graduation in refrigeration from a recognized school of engineering. Also the applicant in the sworn affidavit shall show the refrigerant and types of refrigerating systems with which he has familiarized himself with during his actual engagement or education in the installation or servicing, or both, of refrigerating systems.

1.15: No person, firm or corporation shall install, alter or make major

replacements, such as receivers, condensers, compressors, piping, etc. in any part of any refrigerating system except as herein provided until such person, firm or corporation has filed with this Department and received an approved permit for the work specifically intended on each individual system; provided, that in cases of emergency the permit shall be obtained within seventy-two (72) hours from the time installation, alteration or major replacement was started. Further, provided, that permits will not be required on the installation, alteration, or major replacement and use of refrigerating systems in single or two family residences, or for new unit systems containing not more than six (6) lbs. of refrigerant in Residential Occupancies.

Such applications shall be made on forms provided by the Department and shall contain information deemed pertinent by the Department for the proper description and completion of the work intended except as herein-after provided.

1.20: Ventilating or air circulating systems to be used in conjunction with refrigerating systems shall not be installed or altered, without a permit approved therefor by the Department.

1.25: Blue prints shall be submitted for all refrigerating systems installed, except, unit and other systems for which pertinent ordinance requirements cannot be shown on the application for permits.

Blueprints shall be made in duplicate, shall be drawn to a workable scale and shall bear all pertinent data relating to the installation, such as construction and location of machinery room and method of its ventilation; size and location of piping, valves, fittings and safety devices; volume of rooms where applicable to the ordinance; construction, location and size of ducts and plenum chambers and protective devices appertaining thereto.

1.30: The fees for all licenses and permits, herein provided for, shall be such as may be prescribed by the Board of Rules of the Department.

All licenses and permits shall be issued through the Bureau of the Department and all fees collected thereby shall be paid over to the City Treasurer.

1.35: The Commissioner and his authorized assistants shall have the right during reasonable hours to enter any building or premises in the City of Detroit for the purpose of making any inspections or tests of any refrigerating system, or part thereof, contained therein.

It shall be the duty of the Commissioner's authorized assistants to inspect all refrigerating systems within the City of Detroit, except as hereinafter otherwise provided.

The commissioner or his authorized assistants shall make an inspection of all refrigerating systems, repairs or alterations thereto at the time of installation where such installation, repair or alteration requires a permit under this ordinance. All refrigerating systems actuated by motors or engines which have a standard rating of more than one (1) horsepower each and all refrigerating systems used for air conditioning for human comfort shall be inspected annually, provided that unit system room coolers having a refrigerant containing capacity of not more than ten (10) pounds shall be exempt from this requirement.

In addition to the minimum pressure tests, hereinafter provided for, the Commissioner and his authorized assistants are hereby empowered to make or cause to be made such tests as may be necessary to ascertain the condition of the piping, tubing, fittings, apparatus and machinery used in such refrigerating systems.

Whenever any part of any refrigerating system is found to be unsafe to life or property, the Commissioner or his authorized assistants are hereby empowered to condemn the same, and no such refrigerating system shall thereafter be used until put in a safe condition and approved by the Department.

The Commissioner or his authorized assistants may make such other inspections and tests as are deemed necessary for the purpose of safety and the enforcement of this Ordinance.

It shall be unlawful for owners, contractors or workmen to lath over or in any way conceal any piping, outlet boxes, or other part of a refrigerating system until an inspection has been made thereof and due notice given that the work has been passed upon by the Department. In case any obstruction has been placed so as to conceal any piping or part of the installation before the Department has made an inspection thereof, the Department may remove or cause to be removed any such lath or obstruction which may conceal the work, so that proper inspection may be made.

When any new work, whether installation, alteration or major replacement, for which a permit is required under the provisions of this Ordinance has been completed to the satisfaction of the Department, there shall be issued upon request of the licensee doing said work, a certificate of inspection certifying that the installation is in accordance with the provisions of this Ordinance and that the refrigerating system may be operated. Such certificate shall be posted in a conspicuous place in the proximity of the compressor.

1.40: An annual permit, or license, shall be obtained for all refrigerating systems requiring annual inspection under this Ordinance. If the Commissioner or his authorized assistants shall find that any part of any refrigerating system within the City of Detroit has been installed, altered, or a major replacement made subsequent to the passage of this Ordinance without a permit having first been obtained as herein provided for, or if upon any inspection the Commissioner or his authorized assistants shall be of the opinion that any refrigerating system is unsafe or hazardous to life or property, written notice shall forthwith be given to the owner and user of the refrigerating system of such condition and such refrigerating system or part thereof shall not thereafter be operated until the same has been put in safe condition and approved by the Department, provided, however, that within ten (10) days after any such written notification to such owner or occupant to correct or remedy any hazardous condition an appeal stating specifically the questions which the applicant desires to have passed upon, may be taken to and shall be heard by the Board of Rules of the Department. The members of the Board of Rules are authorized to take testimony and to grant or reject such appeal subject to review by the proper Court.

1.45: No refrigerating system shall be maintained or operated employing a refrigerant other than is specified in this Ordinance without a permit issued by the Department, upon such conditions consistent with the provisions of this Ordinance as are deemed necessary in the interest of public safety by the Commissioner of this Department.

Toxic, irritant or flammable gases or liquids to be used as refrigerants within the City of Detroit shall not be sold to or purchased by other than licensed contractors or persons having a permit from the Department of Building and Safety Engineering of the City of Detroit for such purchase.

1.50: Charging a system with a refrigerant or removing same therefrom shall be done by a licensed refrigeration contractor, his authorized employe or employees or an engineer licensed by the Department to operate refrigerating systems; provided, that in case of fire or emergency the system may be discharged by the Fire Department.

1.51: Nothing in this ordinance shall be construed as limiting the authority of the Fire Department and the Board of Health of the City of Detroit in the enforcement of the provisions of this Ordinance and Code or Rules.

1.55: Commissioner: The Commissioner of the Department of Buildings and Safety Engineering.

Bureau: Bureau of Licenses and Permits of the Department of Buildings and Safety Engineering.

Department: Department of Buildings and Safety Engineering.

Contractor: Any person, firm or corporation duly licensed by the City of Detroit under the provisions of this Ordinance to install, alter or service refrigerating systems in the City of Detroit.

1.60: All previous ordinances, or portions of ordinances, inconsistent with or conflicting with the provisions of this Ordinance and all amendments thereto, are hereby repealed.

1.65: Whenever any person shall violate any of the provisions of this Ordinance, either personally or by conspiring with or causing others to commit acts in violation of this Ordinance, he shall be deemed guilty of a misdemeanor and shall be subject to a fine not exceeding Two Hundred (\$200.00) Dollars, or confined to the Detroit House of Correction for a period not to exceed sixty (60) days, or both, at the discretion of the Court. Every such person shall be deemed guilty of a separate offence for every day on which such violation shall continue.

1.70: Should any article, section, paragraph or provision of this Ordinance be declared by the Courts to be invalid, the same shall not affect the validity of this Ordinance as a whole or any part thereof other than the part so declared invalid.

Section 2—Definitions

For the purpose of this Ordinance the following definitions shall apply:

2.10: Approved—Acceptable to the City of Detroit Department of Building and Safety Engineering.

2.11: Brazed Joint—A brazed joint is a gas-tight joint, obtained by the joining of metal parts with alloys which melt at temperatures higher than 1000° F., but less than the melting temperatures of the joined parts.

2.12: Brine—A liquid which is used for the transmission of heat and which has a flash point above 200° F. as determined by A.S.T.M. method D-56-36 with revisions, and will not generate toxic vapor below 150° F.

2.13: Compressor—A device used in a Refrigerating System for the purpose of increasing the refrigerant pressure.

2.14: Condenser—A vessel or arrangement of pipe or tubing in which vaporized refrigerant is liquified by the removal of heat.

2.15: Condensing Unit—A specific refrigerating machine combination consisting of a compressor, condenser, liquid receiver and the regularly furnished accessories.

2.16: Container—A cylinder for the transportation of refrigerant constructed to conform to the Specifications of the Bureau of Explosive, Pamphlet No. 9, Interstate Commerce Commission.

2.17: Department Store—The entire space occupied by one tenant or more than one tenant in an individual store where more than 100 persons commonly assemble on other than the street level floor for the purpose of buying personal wearables and other merchandise used in the home.

2.18: Duct—A tube or conduit used for conveying air.

2.19: Evaporator—That part of a Refrigerating System in which liquid refrigerant is vaporized to produce refrigeration.

2.20: Expansion Coil—An evaporator constructed of pipe or tubing.

2.21: Fusible Plug—A device containing a fusible member which functions at a predetermined temperature for the relief of pressure.

2.22: Generator—Any device equipped with a heating element used in the Refrigerating System to increase the pressure of the refrigerant in its gas or vapor state for the purpose of liquefying the refrigerant.

2.23: Liquid Receiver—A vessel permanently connected to a system by inlet and outlet pipes for storage of a liquid refrigerant.

2.24: Machinery — Refrigerating equipment including any or all of the following: compressor, condenser, generator, absorber, receiver, connecting pipe, evaporator, or complete Unit System.

2.25: Machinery Room—A room in which is permanently installed and operated a Refrigerating System, but not including evaporators located in a cold storage room, refrigerator box, air cooled space, or other enclosed space. Closets solely contained within and opening only into such room shall be considered a part of the machinery room.

(Continued on Page 17, Column 1)



• This new valve, the latest addition to the Mueller Brass Co. line, is constructed on an entirely different principle than any valve on the market.

Here are its main advantages:

TRIPLE SEAL
TRIPLE DIAPHRAGM LIFE
TRIPLE ACTION
SINGLE TURN OPENING

Watch for it! We'll tell you all about it soon.

MUELLER BRASS CO.
PORT HURON, MICHIGAN, U. S. A.



Polyphase Motors

Wagner polyphase motors are available in all standard sizes up to 400 horsepower. They are available in various electrical types of squirrel-cage motors, slip-ring motors, special air-conditioning motors, and multi-speed motors.

Direct Current Motors

Motors for All Types of Air-Conditioning Equipment

Complete Information and Literature Write to
Wagner Electric Corporation
6400 Plymouth Avenue, Saint Louis, U.S.A.

Single-Phase Motors

Wagner single-phase motors are available in a wide variety of types especially suited for air-conditioning equipment. Wagner repulsion-start-induction, split-phase, capacitor-start-induction-run, capacitor-start capacitor-run (permanently-split and standard two-value) and shaded-pole induction motors are several electrical types of single-phase motors that are widely used on air-conditioning equipment.



• Improve well as SPEED
• Why you can't see the asse
• A sin Cuts nux grip. At holds for NUT gri
• SPEED bronze screws, explaining
Manufact of Patente SPEED NUT

Code Definitions of Refrigerating Systems

(Continued from Page 16, Column 5)

2.26: **Machinery Room, Class T.**—A room in which machinery other than open flame apparatus is permanently installed and operated and which conforms to requirements as follows:

- (1) Doors shall be tight fitting, fire resisting and self-closing.
- (2) Walls shall be of fire resistive material having at least a 2 hour fire rating.
- (3) An exit door shall be provided opening directly to the outer air or through a vestibule-type exit equipped with self-closing vapor-tight doors.
- (4) Exterior openings shall not be under any fire escape or any open stairway.
- (5) Only service pipes shall be permitted to pierce the interior walls or floor of such room, and the openings through which such service pipes pass shall be tightly sealed in the walls or floor.
- (6) Emergency remote controls to stop the action of the refrigerant compressor shall be located immediately outside of the machinery room.
- (7) Mechanical means for ventilation shall be provided.
- (8) Emergency remote controls for the mechanical means of ventilation shall be located outside the machinery room.
- (9) No storage of materials shall be permitted except such materials as required therewith.

2.27: **Manifold**—A header located external to the refrigerated space into which two or more refrigerant containing lines are connected.

2.28: **Mechanical or Hold Fast Joint**—A mechanical or hold fast joint is a joint that will not separate when subjected to a pressure test of five hundred pounds per square inch of pipe area or a tensile test equal to the above while the joint is subjected to a temperature of 800° F.

2.29: **Piping**—Piping or tubing used to connect the various parts of a Refrigerating System.

2.30: **Pressure Limiting Device**—A pressure or temperature responsive mechanism designed to automatically stop the operation of the compressor at a predetermined pressure.

2.31: **Pressure Relief Device**—A valve or rupture member designed to automatically relieve excessive pressure.

2.32: **Pressure Relief Valve**—A valve held closed by a spring or other means and designed to automatically relieve pressure in excess of its setting.

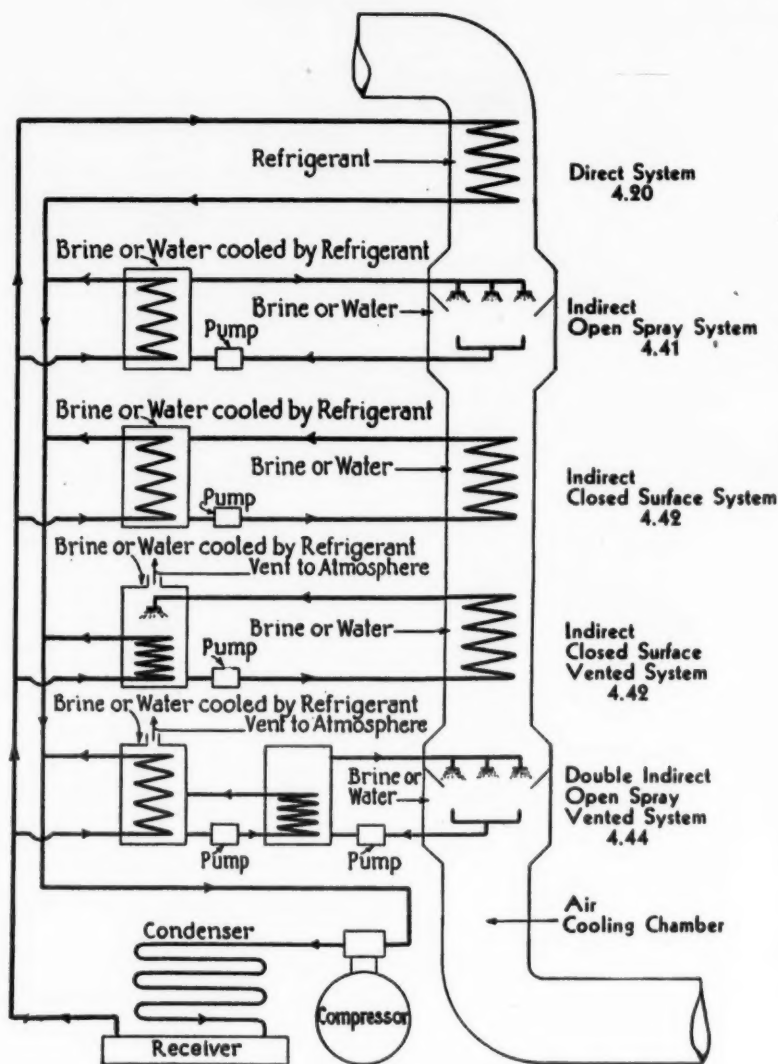
2.33: **Pressure Vessel**—Any refrigerant containing receptacle of a Refrigerating System other than evaporators, expansion coils, headers, and pipe connections.

2.34: **Refrigerating System**—A combination of inter-connected refrigerant containing parts in which a refrigerant is circulated for the purpose of extracting heat.

2.35: **Refrigerant**—A substance used to produce refrigeration by its expansion or vaporization.

2.36: **Rupture Member**—A device that will automatically rupture at a predetermined pressure.

Diagram 1



2.38: **Soldered Joint**—A joint obtained by the joining of metal parts with metallic mixtures or alloys which melt at temperatures below 500° F. and above 350° F.

2.39: **Tenant**—A person, firm or corporation possessed with the legal right to occupy premises.

2.40: **Stop Valve**—A shut-off valve for the control of flow of a refrigerant.

2.42: **Welded Joint**—A joint obtained by the joining of metal parts in the plastic or molten state.

Section 3—Building Occupancy Classification

3.10: **Locations** in which refrigerating systems may be placed are grouped by occupancy as follows:

3.20: **Institutional occupancy** shall apply to that portion of a building in which persons are harbored to receive medical, charitable, educational, or other care or treatment, or in which persons are held or detained by reason of public or civic duty, including, among others, hospitals, asylums, sanitariums, police stations, jails, court houses with cells, and similar occupancies.

3.30: **Public Assembly occupancy** shall apply to that portion of a building in which persons congregate for civic, political, educational, religious, social, or recreational purposes; including among others, auditoriums, assembly rooms, armories, ball rooms, bath houses, broadcasting studios, colleges, court houses without cells, churches, dance halls, department stores, exhibition halls, fraternity halls, lodge rooms, mortuary chapels, museums, schools, libraries, passenger depots, subway stations, bus terminals, theatres, and similar occupancies.

3.40: **Residential occupancy** shall apply to that portion of a building in which sleeping accommodations are provided for more than two families, including, among others, multiple story apartments, tenements, hotels, lodging houses, dormitories, convents, studios, club houses and similar occupancies.

3.50: **Commercial occupancy** shall apply to that portion of a building used for the transaction of business; for the rendering of professional services; for the supplying of food, drink, or other bodily needs and comforts; for manufacturing purposes or for the performance of work or labor, except as included under "Industrial" occupancies, including among others, office buildings, professional buildings, markets, restaurants, laboratories, bake shops, fur storage, loft buildings, stores other than department stores, and similar occupancies.

3.60: **Industrial occupancy** shall apply to an entire building when used by a single tenant for manufacturing processing, or storage of materials or products, including, among others, chemical, food, candy and ice cream factories, ice making plants, refineries, perishable food warehouses, and

similar occupancies where a single tenant is defined as a single authority which operates and maintains the entire refrigerating system.

3.70: **Mixed occupancy** shall apply to a building occupied or used for different purposes in different parts. When the occupancies are cut off from the rest of the building by tight partitions, floors and ceilings and protected by self-closing doors, the requirements for each type of occupancy shall apply for its portion of the building. When the occupancies are not so separated, the occupancy carrying the more stringent requirements shall govern.

Section 4—Refrigerating System Classification By Type

4.10: **Refrigerating Systems** shall be divided into classes descriptive of the method employed for extracting heat as follows:

4.20: **Direct System** is one in which the evaporator is in direct contact with the material or space refrigerated or is located in air circulating passages communicating with such spaces.

4.30: **Unit System** is one which has been assembled and tested prior to its installation and which is installed without connecting any refrigerant containing parts.

4.40: **Indirect System** is one in which a liquid, such as brine or water, cooled by the refrigerant, is circulated to the material or space refrigerated or is used to cool air so circulated. Indirect Systems which are distinguished by the type or method of application are as follows:

4.41: **Indirect Open Spray System** is one in which a liquid such as brine or water, cooled by an evaporator located in an enclosure external to a

cooling chamber, is circulated to such cooling chamber and is sprayed therein.

4.42: **Indirect Closed Surface System** is one in which a liquid, such as brine or water, cooled by an evaporator located in an enclosure external to a cooling chamber, is circulated to and through such a cooling chamber in pipes or other closed circuits.

4.43: **Indirect Closed Surface Vented System** is one in which a liquid, such as brine or water, cooled by an evaporator located in a vented enclosure external to a cooling chamber, is circulated to and through such cooling chamber, in pipes or other closed circuits.

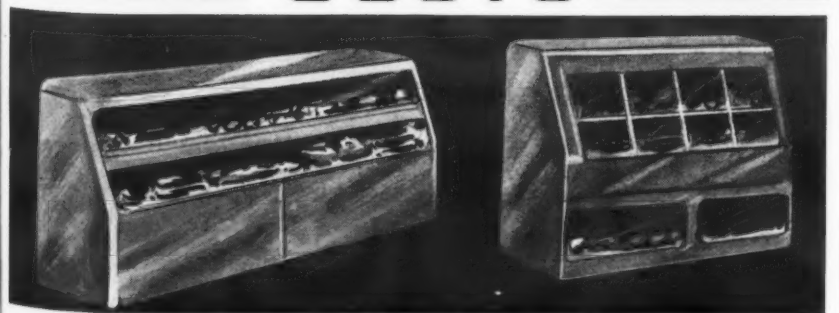
4.44: **Double Indirect Open Spray Vented System** is one in which a liquid such as brine or water, cooled by an evaporator located in a vented enclosure, is circulated through a closed circuit to a second enclosure where it cools another supply of a liquid, such as brine or water, and this liquid in turn is circulated to a cooling chamber and is sprayed therein.

4.45: **Indirect Absorptive Brine System** is an indirect vented open spray system in which the brine will chemically absorb the refrigerant in the system, and the chemical compound so formed in the solution will be stable at temperatures up to 100° F. The brine shall be at such concentration that it will absorb twice the total quantity of refrigerant in the system. An approved automatic device shall be provided for shutting down the system when the brine concentration becomes such that the brine will absorb only one and one-half times the total quantity of refrigerant in the system.

4.46: **Double Refrigerant System** is one in which a refrigerant is used in (Continued on Page 18, Column 1)

assemble your SHOW CASES with the Speed Nut System

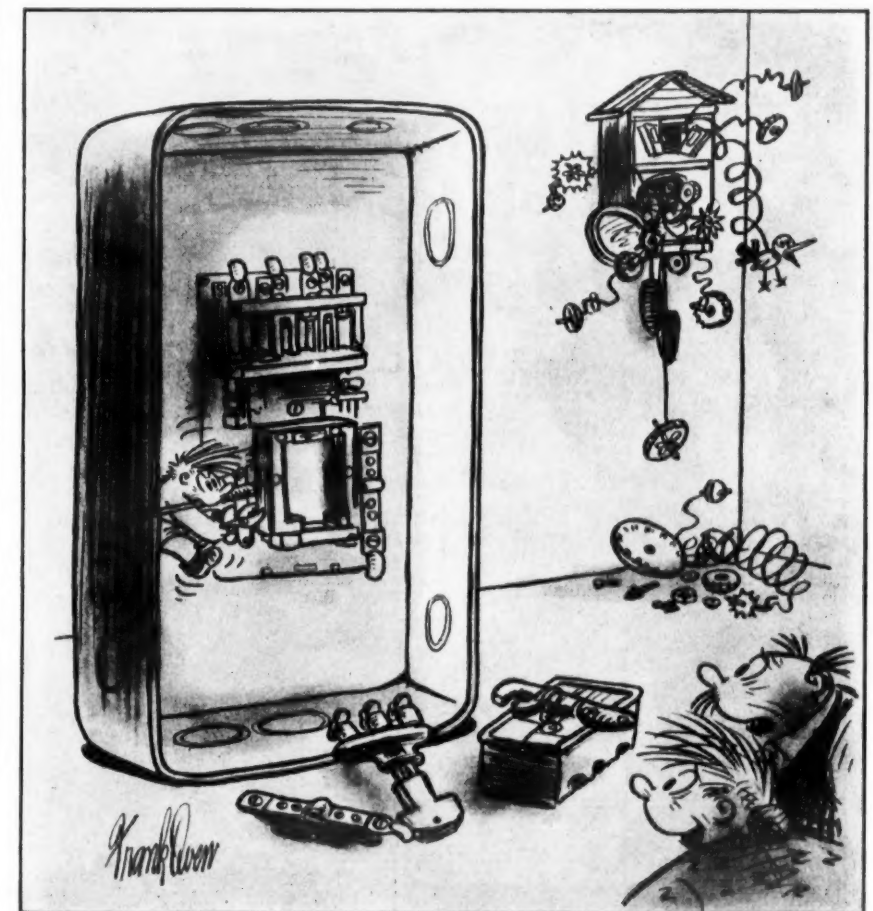
REDUCE COSTS



Improves the Case

- Improve the assembly of your show cases of all sizes and structures, as well as electric refrigerators and air conditioning cabinets, with the SPEED NUT System of assembly.
- Why be troubled with checking and crazing of porcelain surfaces when you can completely circumvent the hazard and at the same time improve the assembly at lower net cost.
- A single SPEED NUT replaces both the threaded nut and lock washer. Cuts number of parts in half, reduces weight, gives a firmer spring tension grip. Absorbs expansion and contraction from temperature changes and yet holds forever tight. The harder the strain or pull, the firmer the SPEED NUT grips.
- SPEED NUTS are manufactured of spring steel, cold rolled steel, phosphor bronze and stainless steel for most standard sizes of machine screws, metal screws, metal rivets and plastic studs. Write for samples and prices today, explaining sizes and uses you contemplate.

Manufacturers of Patented SPEED NUTS
SPEED NUT DIVISION
 TINNEMAN STOVE & RANGE CO.
 2045 Fulton Rd.
 Cleveland Ohio



"He says he's never seen anything so simple!"



Bulletin 709 Solenoid Starter

It was to reduce the possibility of trouble that these Allen-Bradley solenoid starters were made so simple. They have no trouble-making pivots or bearings to corrode or gum up and

delay switch action. Complicated mechanisms and flexible jumpers have been eliminated.

Maintenance men like the double break, silver alloy contacts which

never need cleaning or dressing. These contacts are always in first class operating condition. The efficient solenoid magnet prevents unnecessary shutdowns, even when line voltage conditions are bad. The white interiors, generous wiring space, accessible terminals, and numerous knockouts make installation easy.

SEND FOR "THE STORY OF THE SOLENOID STARTER"



Allen-Bradley Co., 1313 S. First St., Milwaukee, Wis.
 Please send me "The Story of the Solenoid Starter."

NAME _____ COMPANY _____

ADDRESS _____

ALLEN-BRADLEY SOLENOID MOTOR CONTROL

Types of Systems That Are Permitted For Various Occupancies

(Continued from Page 17, Column 5)

the secondary circuit instead of brine or water. For the purpose of this Code, each circuit shall be considered as a separate Direct Refrigerating System.

4.50: The Direct and various Indirect Systems referred to above are illustrated in Diagram 1.

Section 5 Refrigerant Classification

5.10: Refrigerants shall, for purposes of this Code, be divided into groups as follows:

5.11: Group 1

Carbon Dioxide, CO_2 .
Dichlorodifluoromethane (Freon-12), CCl_2F_2 .
Dichloromonofluoromethane (Freon-21), CHCl_2F .
Dichlorotetrafluoroethane (Freon-114), $\text{C}_2\text{Cl}_2\text{F}_4$.
Dichloromethane (Methylene Chloride, Carrene No. 1), CH_2Cl_2 .
Trichloromonofluoromethane (Freon-11, Carrene No. 2), CCl_3F .

5.12: Group 2

Ammonia, NH_3 .
Dichloroethylene, $\text{C}_2\text{H}_2\text{Cl}_2$.
Ethyl Chloride, $\text{C}_2\text{H}_5\text{Cl}$.
Methyl Chloride, CH_3Cl .
Methyl Formate, HCOOCH_3 .
Sulphur Dioxide, SO_2 .

5.13: Group 3

Butane, C_4H_{10} .
Ethane, C_2H_6 .
Isobutane, $(\text{CH}_3)_3\text{CH}$.
Propane, C_3H_8 .

Section 6 Institutional Occupancies

6.10: No refrigerating system shall be installed in or on public stairways or under public stairways except as provided in Paragraph 6.11.

6.11: No refrigerating system shall be installed in public hallways, lobbies, entrances, or exits, except unit systems containing not more than six (6) pounds of a Group (1) refrigerant, provided free passage is not obstructed.

6.12: Refrigerant piping or tubing for refrigerating systems containing more than twenty (20) pounds of a Group (1) refrigerant shall not be carried through the floors except that for the purpose of connecting to a condenser on the roof, it may be carried through a continuous fire resisting (4 hour rating) flue or shaft having no opening on intermediate floors, or it may be carried on the outer wall of the building, provided it is not located in an air shaft, closed court, or in other similar open spaces enclosed within the outer walls of the building.

6.20: No refrigerating system shall be installed in any room except unit systems each containing not more than ten (10) pounds of a Group (1) refrigerant, and then only when a window or other ventilation is provided.

6.21: No refrigerating system containing more than twenty (20) pounds of a Group (1) refrigerant shall be installed in kitchens, laboratories and mortuaries.

6.22: Refrigerating Systems containing more than twenty (20) pounds of a Group (1) refrigerant shall be of the indirect type with all refrigerant

containing parts installed in a Class "T" machinery room.

6.23: When a Group (1) refrigerant, other than carbon dioxide, is used in a refrigerating system, any portion of which is in a room where there is an apparatus for producing an open flame, then such refrigerant shall be classed in Group (2) unless the flame producing apparatus is provided with a hood and flue capable of removing the products of combustion to the open air. Flames by matches, cigarette lighters, small alcohol lamps and similar devices, shall not be considered as open flames.

6.30: Group (2) refrigerants shall not be used except that unit systems containing not more than six (6) pounds of refrigerant may be used in kitchens, laboratories or mortuaries.

6.40: Group (3) refrigerants shall not be used in institutional occupancies.

Section 7—Public Assembly Occupancies

7.10: No refrigerating system shall be installed in or on public stairways or under public stairways except as provided in Paragraph 7.11.

7.11: No refrigerating system shall be installed in public hallways, lobbies, entrances or exits except unit systems as follows, provided free passage is not obstructed:

(a) Unit systems containing not more than six (6) pounds of a Group (1) refrigerant.

(b) Unit systems intended specifically for air conditioning for human comfort shall contain not more than the allowable quantities as given in Paragraph 7.20.

7.12: Refrigerant piping or tubing for refrigerating systems containing more than one thousand (1,000) pounds of a Group (1) refrigerant or more than the allowable quantities

Table A: Refrigerants For Public Occupancies

Refrigerant	Symbol	Maximum Quantity In Pounds per 1,000 Cu. Ft. of Air Conditioned Space
Carbon Dioxide	CO_2	12
Dichlorodifluoromethane (Freon-12)	CCl_2F_2	30
Dichloromethane (Methylene Chloride, Carrene No. 1)	CH_2Cl_2	6
Dichloromonofluoromethane (Freon-21)	CHCl_2F	13
Dichlorotetrafluoroethane (Freon-114)	$\text{C}_2\text{Cl}_2\text{F}_4$	40
Trichloromonofluoromethane (Freon-11)	CCl_3F	35

*Notes:

a. When the refrigerant containing parts of a refrigerating system are located in one or more enclosed spaces, the cubical content of the smallest enclosed space other than the machinery room, shall be used to determine the permissible quantity of the refrigerant in the system.

b. When the evaporator is located in a duct system, the cubical content of the smallest enclosed space served by the duct system shall be used to determine the permissible quantity of refrigerant in the refrigerating system, unless the air flow to any enclosed space served by the duct system cannot be reduced below one quarter ($\frac{1}{4}$) of its maximum, in which case the cubical contents of the entire space served by the duct system shall be used to determine the permissible quantity of refrigerant in the refrigerating system.

permitted in Paragraph 7.20, shall not extend through floors unless it be carried through a continuous fire resisting (4 hours rating) flue or shaft having no openings on intermediate floors, or it may be carried on the outer wall of the building provided it is not located in an air shaft, closed court or in other similar open spaces enclosed within the outer walls of the building.

7.20: The maximum quantity of a Group (1) refrigerant in a direct system used for air conditioning for human comfort shall be limited by the volume of the space to be air conditioned as follows:

7.21: A refrigerating system containing more than fifty (50) pounds of a Group (1) refrigerant and which includes air ducts shall be of the Indirect Type, unless it conforms to requirements as follows:

(a) Plenum chambers, and return ducts other than vertical, shall be so constructed that the interior is accessible to facilitate the cleaning of possible accumulations of dust and combustible materials in them. Clean-out openings at approximately 20 foot intervals shall be provided where return ducts, other than vertical, are of such size that they may not readily be entered to accomplish the cleaning. Supply ducts, other than vertical, shall conform to the above regulations for return ducts—unless all of the supply air passes through either a water spray or filters.

(b) Positive automatic approved fire damper, or dampers, shall be provided to cut off the refrigerant containing apparatus from the duct system and so arranged to close automatically and remain tightly closed upon the operation of a fusible link or other approved device. Hinged dampers shall be equipped with spring catches, pins of hinges shall be of corrosion resistant material.

(c) Automatic means shall be provided to close the dampers and to stop the fan when the temperature of the air in the duct at the damper location reaches 210°F . when the damper is on the discharge side of a refrigerating system containing a heating coil and at 125°F . when the damper is on the suction side of the refrigerating system.

(d) An approved fire damper shall be provided on each opening through a required fire partition.

(e) Air shall not be recirculated from any space in which objectionable quantities of flammable or toxic vapors, flyings, or dust are given off.

(f) When located less than 7 feet above the floor, air inlet and outlet openings shall be protected by a substantial grille or screen of 1 inch or smaller mesh.

(g) Combustible air filters shall not be used unless they are in themselves, or by treatment, sufficiently fire resistant so that fire spreading over the filter when loaded with dust and under operating conditions will not be materially fed by the burning of the filter itself.

(h) Liquid adhesive coatings used

on air filters shall have a flash point not less than 350°F . Cleveland open cup tester.

(i) All air filters shall be kept free of excess dust and combustible materials. If of the automatic oil type, sludge shall be regularly removed from the oil reservoir and if of the replacement media type, the filter media shall be changed at proper intervals to eliminate excessive dust deposits.

(j) In furtherance to the above paragraphs duct construction and installation shall be in accordance to the City of Detroit Official Building Code.

7.22: Refrigerating systems located on the same floor, containing more than one thousand (1000) pounds of a Group (1) refrigerant shall be of the indirect type with all refrigerant containing parts installed in a Class "T" machinery room.

7.23: When a Group (1) refrigerant, other than carbon dioxide is used in a refrigerating system, any portion of which is in a room where there is an apparatus for producing an open flame, then such refrigerant shall be classed in Group (2) unless the flame producing apparatus is provided with a hood and flue capable of removing the products of combustion to the open air. Flames by matches, cigarette lighters, small alcohol lamps and similar devices, shall not be considered as open flames.

7.30: Group (2) refrigerants shall not be used except in Indirect Closed Surface Vented or Double Indirect Open Spray Vented Systems and having all refrigerant containing parts installed in a Class "T" machinery room vented to the outer air or external to the building.

Note: This shall not be construed to cover new unit systems containing not more than twelve (12) pounds of a Group (2) refrigerant intended for display, demonstration and sale, provided such displays and demonstrations be located in stores, sales rooms, and spaces intended primarily for permanent sales purposes.

7.40: Group (3) refrigerants shall not be used in public assembly occupancies.

Section 8 Residential Occupancies

8.10: No refrigerating system shall be installed in or on public stairways or under public stairways except as provided in Paragraph 8.11.

8.11: No refrigerating system shall be installed in public hallways, lobbies, entrances or exits except unit systems as follows, provided free passage is not obstructed:

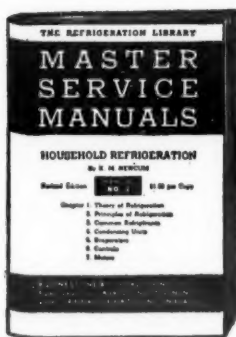
(a) Unit systems containing not more than six (6) pounds of a Group (1) or a Group (2) refrigerant.

(b) Unit systems intended specifically for air conditioning for human comfort shall contain not more than the allowable quantities as given in Paragraph 8.20.

(Continued on Page 19, Column 1)

A Set of Manuals for the Use of the Refrigeration Service Man

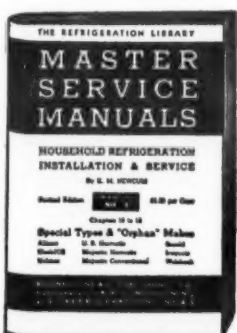
Master Service Manuals on HOUSEHOLD refrigeration, installation and service provide a complete and inexpensive course of study for the beginner and valuable reference books for the experienced service man. The author, K. M. Newcum, has taught classes of beginners and advanced students at David G. Rankin School of Mechanical Trades, St. Louis, Mo. and West Side Y. M. C. A., New York, N. Y.



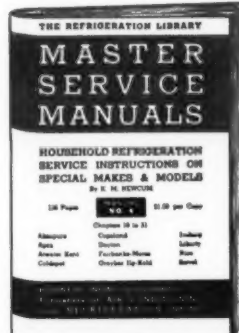
MANUAL NO. 1—Theory and Principles of refrigeration explained in simple terms. Characteristics of various refrigerants in common use. An explanation of the construction and operation of the major component parts of a household refrigerator. 144 pages. Price \$1.00.



MANUAL NO. 2—Diagrams show how to distinguish the difference between the fundamental types of systems. Detailed instructions regarding the proper methods of installing and servicing each type. A comprehensive guide for all the popular makes. 128 pages. Price \$1.00.



MANUAL NO. 3—Detailed data on methods of servicing several special types of refrigerators (now classified as "orphan makes") including Allison, Electrice, Holmes, U. S. Hermetic, Majestic Hermetic, Majestic Conventional, Socold, Iroquois, and Welsbach. 144 pages. Price \$1.00.



MANUAL NO. 4—Service information on 12 makes of household electric refrigerators including Absopure, Apex, Atwater Kent, Coldspot (Sears and Sunbeam), Copeland, Dayton (Niagara), Fairbanks-Morse, Graybar Ig-Kold, Iceberg, Liberty, Rice, Servel. 136 pages. Price \$1.00.

Note: The minimum extra charge for each package of books shipped outside of the United States is 50 cents. Up to six of the regular \$1.00 books may be shipped in one package.

BUSINESS NEWS PUBLISHING CO., 5229 Cass Ave., Detroit, Michigan

Table B: Refrigerants For Residential Occupancies

Refrigerant	Symbol	Maximum Quantity In Pounds per 1,000 Cu. Ft. of Air Conditioned Space
Carbon Dioxide	CO_2	12
Dichlorodifluoromethane (Freon-12)	CCl_2F_2	30
Dichloromethane (Methylene Chloride, Carrene No. 1)	CH_2Cl_2	6
Dichloromonofluoromethane (Freon-21)	CHCl_2F	13
Dichlorotetrafluoroethane (Freon-114)	$\text{C}_2\text{Cl}_2\text{F}_4$	40
Trichloromonofluoromethane (Freon-11)	CCl_3F	35

*Notes:

a. When the refrigerant containing parts of a refrigerating system are located in one or more enclosed spaces, the cubical content of the smallest enclosed space other than the machinery room, shall be used to determine the permissible quantity of the refrigerant in the refrigerating system.

b. When the evaporator is located in a duct system, the cubical content of the smallest enclosed space served by the duct system shall be used to determine the permissible quantity of refrigerant in the refrigerating system, unless the air flow to any enclosed space served by the duct system cannot be reduced below one quarter ($\frac{1}{4}$) of its maximum, in which case the cubical contents of the entire space served by the duct system shall be used to determine the permissible quantity of refrigerant in the refrigerating system.

Rules & Regulations On Commercial Jobs

(Continued from Page 18, Column 5)

8.12: Refrigerant piping or tubing for refrigerating systems containing more than 1,000 pounds of a Group (1) refrigerant; more than the allowable quantity permitted in paragraph 8.20; or a Group (2) refrigerant, shall not extend through floors—unless it be carried through a continuous fire resisting (four hour rating) flue or shaft having no openings on intermediate floors; or it may be carried on the outer walls of the building, provided it is not located in an air shaft, closed court, or in other similar open spaces enclosed within the outer walls of the building.

8.20: The maximum quantity of refrigerant in a direct system used for air conditioning for human comfort, shall be limited by the volume of the space to be air conditioned as follows: (See Table B.)

8.21: A system containing more than fifty (50) pounds of a Group (1) refrigerant and which includes air ducts shall be of the Indirect Type, unless it conforms to requirements as follows:

(a) Plenum chambers, and return ducts other than vertical, shall be so constructed that the interior is accessible to facilitate the cleaning of possible accumulations of dust and combustible materials in them. Clean-out openings at approximately 20 foot intervals shall be provided where return ducts, other than vertical, are of such size that they may not readily be entered to accomplish the cleaning. Supply ducts, other than vertical, shall conform to the above regulations for return ducts—unless all of the supply air passes through either a water spray or filters.

(b) Positive automatic approved fire damper, or dampers, shall be provided to cut off the refrigerant containing apparatus from the duct system and so arranged to close automatically and remain tightly closed upon the operation of a fusible link or other approved device. Hinged dampers shall be equipped with spring catches, pins of hinges shall be of corrosion resistant material.

(c) Automatic means shall be provided to close the dampers and to stop the fan when the temperature of the air in the duct at the damper location reaches 210° F. when the damper is on the discharge side of a refrigerating system containing a heating coil and at 125° F. when the damper is on the suction side of the refrigerating system.

(d) An approved fire damper shall be provided on each opening through a required fire partition.

(e) Air shall not be recirculated from any space in which objectionable quantities of flammable or toxic vapors, flyings or dust are given off.

(f) When located less than 7 feet above the floor, air inlet and outlet openings shall be protected by a substantial grille or screen of 1 inch or smaller mesh.

(g) Combustible air filters shall not be used unless they are in themselves, or by treatment, sufficiently fire resistant so that fire spreading over the filter when loaded with dust and under operating conditions will not be materially fed by the burning of the filter itself.

(h) Liquid adhesive coatings used on air filters shall have a flash point not less than 350° F., Cleveland open cup tester.

(i) All air filters shall be kept free of excess dust and combustible materials. If of the automatic oil type, sludge shall be regularly removed from the oil reservoir and if of the replacement media type, the filter media shall be changed at proper intervals to eliminate excessive dust deposits.

(j) In furtherance to the above paragraphs duct construction and installation shall be in accordance to the City of Detroit Official Building Code.

8.22: A system containing more than one thousand (1,000) pounds of a Group (1) refrigerant shall be of the indirect type.

8.30: No system containing more than six (6) pounds of a Group (2) refrigerant shall be located in sleeping rooms or spaces directly connected to sleeping rooms. Group (2) refrigerants used in refrigerating systems containing six (6) pounds or less shall have suitable irritant or warning properties.

8.31: No refrigerating system containing more than six (6) pounds of a Group (2) refrigerant shall be used for air conditioning for human comfort, except in an Indirect Closed Surface Vented System, or in a Double Indirect Open Spray Vented System, or in an Indirect Absorptive Brine Type, or in the primary circuit of a Double refrigerant System. Group (2) refrigerants used in a refrigerating system containing six (6) pounds or less shall have suitable irritant or warning properties.

8.32: A system containing more than three hundred (300) pounds of a Group (2) refrigerant shall have all refrigerant containing parts installed in a Class "T" Machinery Room vented to the outer air.

8.40: Group (3) refrigerants shall not be used except in a unit system containing not more than six (6) pounds of refrigerant.

Section 9 Commercial Occupancies

9.10: No refrigerating system shall be installed in or on a public stairway.

9.11: No refrigerating system shall be installed in public hallways, lobbies, entrances or exits except unit systems as follows, provided free passage is not obstructed:

(a) Unit systems containing not more than six (6) pounds of refrigerant.

(b) Unit systems intended specifically for air conditioning for human comfort shall contain not more than the allowable quantities as given in Paragraph 9.20.

9.12: Refrigerant piping or tubing for refrigerating systems containing more than 1,000 pounds of a Group (1) refrigerant; more than the allowable quantity permitted in paragraph 9.20; or a Group (2) refrigerant; shall not be carried through floors except from basements to the first floor or from the top floor to a penthouse or the roof; or except that for the purpose of connecting to equipment on the roof, it may be carried through a continuous fire resisting (four hour rating) flue or shaft having no openings on intermediate floors or it may be carried on the outer wall of the building, provided it is not located in an air shaft, closed court or in other similar open spaces enclosed within the outer walls of the building.

9.20: The maximum quantity of refrigerant in a direct system used for air conditioning for human comfort shall be limited by the volume of the space to be air conditioned as follows: (See Table C.)

9.21: A refrigerating system containing more than fifty (50) pounds of a Group (1) refrigerant and which includes air ducts shall be of the Indirect type, unless it conforms to requirements as follows:

(a) Plenum chambers, and return ducts other than vertical, shall be so constructed that the interior is accessible to facilitate the cleaning of possible accumulations of dust and combustible materials in them. Clean-out openings at approximately 20 foot intervals shall be provided where return ducts, other than vertical, are of such size that they may not readily be entered to accomplish the cleaning. Supply ducts, other than vertical, shall conform to the above regulations for return ducts—unless all of

the supply air passes through a water spray or filters.

(b) Positive automatic approved fire damper, or dampers, shall be provided to cut off the refrigerant containing apparatus from the duct system and so arranged to close automatically and remain tightly closed upon the operation of a fusible link or other approved device. Hinged dampers shall be equipped with spring catches, pins of hinges shall be of corrosion resistant material.

(c) Automatic means shall be provided to close the dampers and to stop the fan when the temperature of the air in the duct at the damper location reaches 210° F. when the damper is on the discharge side of a refrigerating system containing a heating coil and at 125° F. when the

damper is on the suction side of the refrigerating system.

(d) An approved fire damper shall be provided on each opening through a required fire partition.

(e) Air shall not be recirculated from any space in which objectionable quantities of flammable or toxic vapors, flyings or dust are given off.

(f) When located less than 7 feet above the floor, air inlet and outlet openings shall be protected by a substantial grille or screen of 1 inch or smaller mesh.

(g) Combustible air filters shall not be used unless they are in themselves, or by treatment, sufficiently fire resistant so that fire spreading over the filter when loaded with dust and under operating conditions will

not be materially fed by the burning of the filter itself.

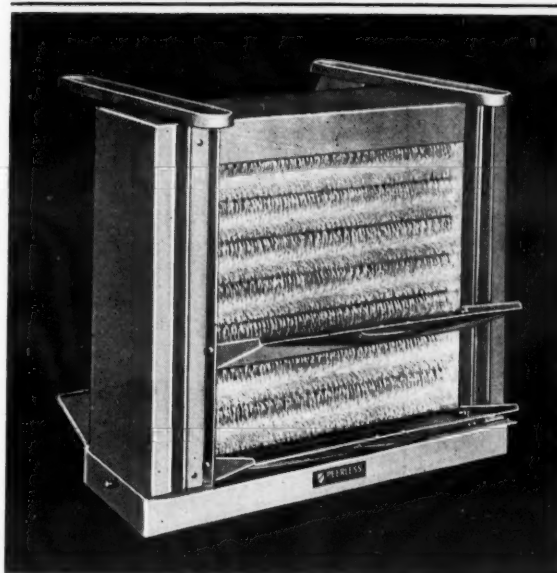
(h) Liquid adhesive coatings used on air filters shall have a flash point not less than 350° F., Cleveland open cup tester.

(i) All air filters shall be kept free of excess dust and combustible materials. If of the automatic oil type, sludge shall be regularly removed from the oil reservoir and if of the replacement media type, the filter media shall be changed at proper intervals to eliminate excessive dust deposits.

(j) In furtherance to the above paragraphs duct construction and installation shall be in accordance to the City of Detroit Official Building Code.

(Continued on Page 20, Column 1)

THE BUYER'S GUIDE



All the Advantages of Forced Convection Refrigeration Plus HIGH BOX HUMIDITY with the NEW

PEERLESS UNIT COOLER

Here is one Unit Cooler that actually does maintain the high box humidity so necessary to satisfactory refrigeration.

Peerless High Dispersion Heat Transfer Surface (an exclusive Peerless development, found in no other forced convection coolers) is far more efficient than ordinary finned cooling surface—actually does maintain desired relative humidity—and solves defrosting problems, even at temperatures as low as 33° F.

This is without question the outstanding Unit Cooler on the market. A trial on your next installation will convince you.

PEERLESS of AMERICA, Inc.

New York Factory Main Factory—General Offices
43-20 34th Street 515 West 35th Street Pacific Coast Factory
Long Island City Chicago 3000 S. Main Street
EXPORT DIVISION: P. O. Box 636, Detroit, Mich., U. S. A.
BUY PEERLESS FOR PERFORMANCE



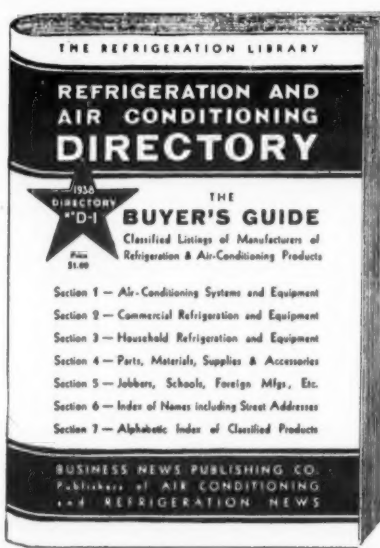
Beyond COMPARISON

PELCO gives the buyer twice as much—that's why it's beyond comparison as a profit-maker for you. Any place selling bottled beverages is a prospect for PELCO with its enormous hourly capacity. PELCO makes its own floating ice automatically as needed and gives in addition a roomy refrigerator compartment below... requires no more installation than plugging it into a light socket. PELCO makes profits for the user—operates on a few cents a day—that's why it's profitable for you to sell.

PELCO is a clean, sweet, manufacturing job that lets you make a profit and KEEP it. CASH IN on the Super-powered PELCO NOW—write for all the facts. Address Desk A-98.



Refrigeration Division
PORTABLE ELEVATOR MFG. CO.
BLOOMINGTON, ILLINOIS
In Canada, UNIVERSAL COOLER CO. of CANADA, LTD. BRANTFORD, ONTARIO



A Complete Buying Guide

The 1938 Refrigeration & Air Conditioning Directory No. D-1 lists all of the products used in refrigeration and air conditioning, gives names and addresses of all known manufacturers of these products. Every buyer of refrigeration and air-conditioning equipment, materials, parts, tools, or supplies needs a copy of this valuable book. Now available at a new low price. Send for your copy now!

252 PAGES

\$1.00 per COPY

BUSINESS NEWS PUBLISHING CO.
5229 CASS AVE. DETROIT, MICH.

Table C: Refrigerants For Commercial Occupancies

Refrigerant	Symbol	Maximum Quantity In Pounds per 1,000 Cu. Ft. of Air Conditioned Space*
Carbon Dioxide	CO ₂	12
Dichlorodifluoromethane (Freon-12)	CCl ₂ F ₂	30
Dichloromethane (Methylene Chloride, Carrene No. 1)	CH ₂ Cl ₂	6
Dichloromonofluoromethane (Freon-21)	CHCl ₂ F	13
Dichlorotetrafluoroethane (Freon-114)	C ₂ Cl ₂ F ₄	40
Trichloromonofluoromethane (Freon-11)	CCl ₃ F	35

*Notes:

a. When the refrigerant containing parts of a refrigerating system are located in one or more enclosed spaces, the cubical content of the smallest enclosed space, other than the machinery room, shall be used to determine the permissible quantity of the refrigerant in the refrigerating system.

b. When the evaporator is located in a duct system, the cubical content of the smallest enclosed space served by the duct system shall be used to determine the permissible quantity of refrigerant in the refrigerating system, unless the air flow to any enclosed space served by the duct system cannot be reduced below one quarter (1/4) of its maximum, in which case the cubical contents of the entire space served by the duct system shall be used to determine the permissible quantity of refrigerant in the refrigerating system.



"Ranco? YES SIR!"

RANCO COMMERCIAL CONTROLS are recognized as leaders in the field—and the Ranco line includes controls needed for locker storage plants.

See your Ranco Jobber—when you need controls for Beverage Coolers, Water Coolers, Ice Cream Cabinets, Display Cases and similar applications.

Ranco Inc., Columbus, Ohio, U.S.A.

RANCO COMMERCIAL CONTROLS

Code Requirements on Installation Methods

(Continued from Page 19, Column 5)

9.22: A system containing more than one thousand (1,000) pounds of a Group (1) refrigerant shall be of the indirect type.

9.30: No refrigerating system containing more than twenty (20) pounds of a Group (2) refrigerant shall be used for air conditioning for human stallation shall be in accordance to the comfort, except in an indirect closed surface vented system or in a double indirect open spray vented system, or in an indirect absorptive brine type, or in the primary circuit of a

double refrigerant system. Group (2) refrigerants used in refrigerating systems containing twenty (20) pounds or less shall have suitable irritant or warning properties.

9.31: A refrigerating system containing more than six hundred (600) pounds of a Group (2) refrigerant shall have all refrigerant containing parts installed in a Class "T" Machinery Room.

9.40: Group (3) refrigerants shall not be used except in a unit system containing not more than six (6) pounds of refrigerant.

Section 10 Industrial Occupancy

10.10: There shall be no restriction on the quantity or kind of refrigerant used in an industrial occupancy.

10.20: Exits provided in industrial occupancies shall be in accordance with the requirements of the Official Building Code of the City of Detroit, provided that all rooms in or through which refrigerant containing parts are installed shall be provided with at least one additional emergency exit for each fifty persons employed in such rooms.

Such emergency exits may lead to adjoining rooms or spaces.

Section 11 Installation Requirements

11.10: Not more than two (2) self-contained condensing units shall be located one above the other within the same floor area between floor and ceiling.

11.11: All moving machinery shall be provided with adequate guards in accordance with the American Standard Safety Code for Mechanical Power Transmission Apparatus, A.S.A. B-15-27 with revisions.

11.12: Adequate illumination and space for inspection and servicing of condensing units shall be provided.

11.13: Condensing units with enclosures shall be readily accessible for servicing and inspection.

11.20: All connections made with the public water supply shall be in accordance to the State of Michigan and City of Detroit Plumbing Codes and Regulations.

11.21: Discharge water lines from condensers or other refrigerating equipment shall be in accordance to the State of Michigan and City of Detroit Plumbing Codes and Regulations.

11.30: The installation of all electrical equipment and wiring shall be in accordance with the requirements of the City of Detroit Electrical Code and the latest edition of the National Electrical Code, as approved by A.S.A.

Gas Devices

11.40: The installation of all gas fuel devices and equipment used with refrigerating systems shall be in accordance with the Official Building Code of the City of Detroit.

11.50: When the quantity of refrigerant in any one refrigerating

of the refrigerant or the oil, or the combination of both.

12.11: Standard weight steel or wrought iron pipe conforming to A.S.T.M. A-53 may be used for refrigerants requiring field test pressures (Table 3, Section 14) not exceeding 250 pounds per square inch, provided lap welded or seamless pipe is used for sizes larger than two (2) inches (I.P.S.). For sizes smaller than one (1) inch extra strong pipe shall be used for all test pressures except as hereinafter specified. For refrigerants requiring field test pressures (Table 3, Section 14) exceeding 250 pounds, but not above 1,000 pounds per square inch, extra strong steel or wrought iron pipe conforming to A.S.T.M. A-53 shall be used. For refrigerants requiring field test pressures (Table 3, Section 14) in excess of 1,000 pounds per square inch, double extra strong steel or wrought iron pipe conforming to A.S.T.M. A-53 shall be used.

12.12: Pipe joints may be screwed, flanged or welded. Screwed joints shall conform to A.S.A. Pipe Thread Standard No. B-2-1919. Exposed pipe threads shall be tinned or otherwise coated to prevent corrosion. Flange bolts shall project through nuts.

12.13: Welds shall conform to the Welding Section of the Code for Pressure Piping A.S.A. B-31-35 with revisions.

12.14: Valves, flanges and fittings may be made of cast iron, malleable iron, bronze or steel castings, hot forged or drop forged steel, wrought copper, bronze or brass, and shall be of the design and material listed as standard by manufacturers for the particular refrigerant service, provided that cast iron conforms to A.S.T.M. designation A-126-30 with revisions, Class "B" higher strength gray iron with not less than 30,000 pounds per square inch tensile strength.

12.15: Bushings may be used in fittings when the reduction is two or more pipe sizes. For single pipe size reduction, reducing fittings shall be used.

12.16: Pipe bends shall be substantially circular in section and free from injurious wrinkles, buckles, kinks and creases. This shall not be construed as barring corrugated pipe bends made of suitable material.

12.19: On all copper pipe or tube the name or trade mark of the manufacturer and a designation indicating the class or wall thickness shall be permanently marked at intervals not greater than four and one-half feet.

12.20: Hard copper tubing used for refrigerant piping erected on the premises shall conform to A.S.T.M. designation B-88-33, Class "K" or "L".

12.22: Soft annealed copper tubing used for refrigerant piping erected on the premises shall conform for quality to A.S.T.M. specification B-88-33 with revisions, and:

(a) In sizes not greater than 5/8 inches outside diameter shall have a recognized standard wall thickness of .035 inches or greater.

(b) In sizes larger than 5/8 inches outside diameter only 5/8 inches or 3/4 inch nominal sizes, class "K" or "L" shall be used.

12.23: Rigid metal enclosures shall be provided for soft annealed copper tubing used for refrigerant piping erected on the premises, except that flexible metal enclosures may be used at bends or terminals if not exceeding six (6) feet in length. No enclosure shall be required for connections between condensing unit and the nearest riser box, provided such connections do not exceed six (6) feet in length.

12.24: Threaded joints on copper or brass pipe (I.P.S.) shall be made with extra heavy brass fittings of material conforming to A.S.T.M. specification No. B-62-36 with revisions. Joints on annealed copper tubing (not exceeding 5/8 inch outside diameter) may be made with flared compression fittings of approved type, provided that all such fittings shall be exposed for visual inspection. Joints on hard drawn copper tubing, if of the full sweated capillary type, shall be made with an alloy having a melting point greater than 1,000° F. or with a solder melting at a point below 500° F. and above 350° F. Fittings used in sweated capillary joints shall be cast red brass or die stamped brass or copper, forged or wrought brass or copper or extruded brass or copper when used with a solder having a melting point below 500° F. and above 350° F. and shall be of an approved type of fast-holding or mechanical joint which will make up mechanically tight without solder, the solder being used only as a seal.

12.25: No soldered joints fabricated on the premises shall be permitted in the air stream of refrigerant containing apparatus used in air conditioning for human comfort unless such joints comply with Paragraph 12.24.

12.29: Stop valves shall be in an immediately accessible location for operation.

Stop valves as required on refrigerating systems containing more than five hundred (500) pounds of a group (1) refrigerant or more than fifty (50) pounds of a group (2) or group (3) (Continued on Page 21, Column 1)

Table D: For Industrial Occupancies Allowable In Presence of Flame

Refrigerant	Symbol	Maximum Quantity in Lb. per 1,000 Cu. Ft. Of Room Volume*
Butane	C ₄ H ₁₀	3
Ethyl Chloride	C ₂ H ₅ Cl	6
Methyl Chloride	CH ₃ Cl	10
Methyl Formate	HCOOH	7
Propane	C ₃ H ₈	3

system exceeds the amount given in the following table (Table D) for each one thousand (1,000) cu. ft. of room volume in which the refrigerating system or any part thereof is installed, then no permanent flame producing device or hot surfaces above 800° F. shall be permitted in such room and all electrical equipment in the room shall conform to the requirements of the City of Detroit Electrical Code and the National Electrical Code for Class 1, Group D, Hazardous Locations.

11.60: Refrigerating Machinery Rooms shall be provided with tight fitting doors and partitions, except where otherwise herein specified.

11.61: Refrigerating Machinery Rooms shall be provided with means for ventilation to the outer air. The ventilation shall consist of windows or doors opening to the outer air, of the size shown in Table 1, or of mechanical means capable of removing the air from the room in accordance with Table 1.

11.62: When mechanical means are used, they shall consist of a power driven exhaust fan, which shall be capable of removing from the refrigerating machinery room the amount of air specified in Table 1. The inlet to the fan shall be located near the refrigerating equipment. The outlet from the fan shall terminate outside of the building. When air ducts are used on either the inlet or discharge side of the fan, they shall have an area not less than specified in Table 1. Sharp bends shall be avoided in the ducts.

11.63: Class "T" Machinery Rooms in basements or sub-basements shall have mechanical ventilation operating continuously.

Section 12—Refrigerant Piping, Valves, Fittings & Related Parts

12.10: All materials used in the construction and installation of refrigerating systems shall be suitable for the refrigerant used, and no material shall be used that will deteriorate due to the chemical action

12.17: Copper or red brass pipe (I.P.S.) (not less than 80% copper) may be used in place of steel and wrought iron pipe if otherwise complying with Paragraph 12.11 for application.

Table 1

Pounds of Refrigerant In System	Mechani-	Mechani-	Window Or Door Area in Sq. Ft.
	cal Cu. Ft. Per Minute Discharge	cal Sq. Ft. Duct Area	
Up to 20	150	¼	4
50	250	⅓	6
100	400	½	10
150	550	⅔	12½
200	680	¾	14
250	800	1	15
300	900	1	17
400	1,100	1¼	20
500	1,275	1½	22
600	1,450	1½	24
700	1,630	1½	26
800	1,800	2	28
900	1,950	2	30
1,000	2,050	2	31
1,250	2,250	2¼	33
1,500	2,500	2¼	37
1,750	2,700	2¼	38
2,000	2,900	2¼	40
2,500	3,300	2½	43
3,000	3,700	3	48
4,000	4,600	3¾	55
5,000	5,500	4½	62
6,000	6,300	5	68
7,000	7,200	5½	74
8,000	8,000	5¾	80
9,000	8,700	6¼	85
10,000	9,500	6½	90
12,000	10,900	7	100
14,000	12,200	7½	109
16,000	13,300	7¾	118
18,000	14,300	8	125
20,000	15,200	8¼	130
25,000	17,000	8¾	140
30,000	18,200	9	145
35,000	19,400	9¼	150
40,000	20,500	9½	155
45,000	21,500	9¾	160

BUNDY TUBING
Copper-Braced Steel. Copper Coated Inside and Out. Sizes: 1/8" to 1 1/2" O.D.
BUNDY TUBING CO., DETROIT

Dayton V-BELTS
Silent, vibrationless, dependable, long-lasting. Powerful grip prevents slippage. A nearby distributor carries a complete stock for appliances and machines.
THE DAYTON RUBBER MFG. CO., DAYTON, OHIO
World's Largest Manufacturer of V-Belts

Anaconda Copper Refrigeration Tubes
Dependable!
THE AMERICAN BRASS CO.
FRENCH SMALL TUBE BRANCH
General Offices, Waterbury, Conn.

THE BUYER'S GUIDE



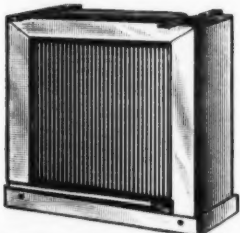
DISTRIBUTORS WANTED!

Write for details of Profit-making franchise. Complete PERCIVAL line meets every requirement of the modern food store.

Modern styling . . . Beautiful design . . . Outstanding construction . . . Economical operation! TOMORROW'S case, presented TODAY! Get the jump on other distributors by selling this modern marvel of electrical refrigeration. Its NEW style and NEW features give you exclusive selling advantages! NEW PERCIVAL FINANCE PLAN HELPS YOU SELL.

C. L. PERCIVAL COMPANY
DES MOINES IOWA
52 YEARS OF SERVICE 1886-1938

For maximum efficiency, specify



LARKIN Humi-Temp

The Scientifically Designed Forced-Air Cooling Unit that Positively Assures More Fin and Tube Area, Higher Relative Humidity, and LESS WEIGHT LOSS from Stored Products.

NO installation can be more efficient than the cooling unit you put in it. Avoid unpleasantness and complaints . . . be assured of superior performance, the complete satisfaction and lasting appreciation of every customer, by supplying the celebrated LARKIN HUMI-TEMP, praised by enthusiastic users everywhere. Familiarize yourself now with the unique Larkin features responsible for HUMI-TEMP'S extraordinary efficiency, low operating costs . . . write today for complete information, specifications, and new low prices.

Built Only by

LARKIN COILS, INC.

General Offices and Factory:
519 Fair Street, S. E., Atlanta, Ga.
Branch Factory: New York City, N. Y.

Originators of the Cross Fin Coil

WELDED STEEL
THE KOCH LINE IS Complete
Walk-In Coolers, Commercial Refrigerators
and all types of Display Cases

Koch does not manufacture or sell condensing units. Koch distributors therefore furnish the units they sell.

Write Today for Information on PROFIT POSSIBILITIES

KOCH REFRIGERATORS
NORTH KANSAS CITY, MO.

Safety Devices as Required In Code

(Continued from Page 20, Column 5)
refrigerant shall be provided with fixed means of operation.

Stop valves shall be required on refrigerant inlet and outlet connections, except unit systems, as follows:

(1) Pressure Vessels:

(a) When assembled and interconnected on a common base, such group of vessels shall be provided with stop valves on the inlet and outlet refrigerant connections to piping or tubing terminating at remote refrigerating equipment.

(b) Stop valves shall not be located between a pressure relief device (See Para. 13.23), pressure limiting device or other protective device controlling pressure and that part of the refrigerating system protected thereby.

(2) Evaporators & Expansion Coils:

(a) When located in the same refrigerated space shall not require stop valves except when used with a refrigerating system containing more than 150 pounds of refrigerant.

(b) When connected from manifolds shall have a stop valve placed in each pipe or tubing connection at, and between, the manifold and the evaporator or expansion coil.

(c) When located in separate refrigerated spaces and manifolded (refer 2b above), when not connected to a manifold and the refrigerating system contains more than 100 pounds of refrigerant, each evaporator or expansion coil shall be provided with a stop valve on the refrigerant inlet and outlet connection.

(d) Flooded Types.

(3) Condensers:

(a) Evaporative or air cooled types shall not require stop valves except when used on refrigerating systems containing more than a total charge of 200 pounds of refrigerant.

(b) When combined with pressure vessels and assembled and interconnected on a common base or in a common enclosing case, the refrigerant inlet and outlet connections on the assembly shall be provided with stop valves.

13.30: Stop valves used with copper tubing shall be securely mounted independent of tubing fastenings or supports.

13.31: Stop valves placed where it is not obvious what they control shall be suitably labeled. Numbers may be used to label the valves provided a legible key to the numbers be labeled near the valves.

13.40: All refrigerant pipe, tube and fittings shall be of strong, durable and fire resisting material to relieve excessive vibration and strains. All piping and tubing shall be securely supported by means of metal hangers, brackets, straps, clamps or pedestals, in such manner as to relieve joints of strains and vibration. The supports shall be used for no other purpose. Hangers for piping or tubing above 1/2 inch I.P.S. shall not be less than 0.125 square inch cross section.

13.50: Refrigerant piping or tubing crossing an open space which affords passageway in any building shall not be less than 7 1/2 feet above the floor unless against the ceiling of such space.

13.51: Refrigerant piping or tubing shall not be placed in a hallway, lobby, stairway, elevator or dumb waiter shaft, except that such piping or tubing may pass across a hallway if there be no joints in the section in the hallway and it be contained in a rigid metal pipe. The requirements of this paragraph for rigid metal pipe enclosure or placing of piping or tubing and joints in hall-

ways shall not apply to Section (10), Industrial Occupancies.

13.52: Refrigerant piping or tubing, with or without insulation covering, shall be exposed to view, excepting for mechanical protection herein specified, or when located in the cabinet of a unit system. This does not apply to refrigerant piping or tubing installed outside the building or in a flue vented to the outer air.

Section 13 Design, Construction and Safety Devices

13.10: Every part of a refrigerating system, excepting pressure gauges and control mechanism, shall be designed, constructed and assembled to withstand the test pressures specified in Table No. (3).

13.11: Equipment listed by the Underwriters' Laboratories, Incorporated, will be accepted as meeting the requirements of paragraph 13.10.

13.12: Refrigerant containing vessels which are not listed by Underwriters' Laboratories, Incorporated, directly or as a part of a complete unit, shall be designed and constructed in accordance with the rules of Section 8 (Unfired Pressure Vessel Section) of the A.S.M.E. Boiler Construction Code, and shall bear the A.S.M.E. symbol.

13.20: Each pressure vessel shall be protected from over pressure by an approved pressure relief device if its volume exceeds five (5) cubic feet and its diameter exceeds six (6) inches.

13.21: All refrigerating systems, unless so constructed that pressure due to temperature conditions will be relieved by soldered joints, lead gaskets, fusible plugs, or other parts of the refrigerating system, shall be protected by a pressure relief device.

13.22: A rupture member having a relief opening of not less than one-quarter inch (1/4") in diameter may be substituted for the pressure relief valve in a carbon dioxide system or a system normally operating below atmospheric pressure.

13.23: No shut-off valve shall be located between any automatic pressure relieving device and the part or parts of the system protected thereby, unless two such devices are provided and so arranged that only one can be closed at a time.

13.24: The effective aggregate capacity of pressure relief devices for a refrigerant containing vessel shall be determined by the following formula:

$$C = fDL$$

C = rated discharge capacity of the relief device in pounds air per minute.

D = outside diameter (in feet) of the vessel.

L = length (in feet) of the vessel.

f = factor dependent upon kind of refrigerant as follows:

Ammonia (NH₃) 0.5

Dichlorodifluoromethane

(Freon-12) 1.5

All other refrigerants 1.0

13.25: All pressure relieving devices for refrigerant containing vessels, such as spring loaded safety valves, frangible discs or other approved pressure actuated devices shall be directly pressure actuated and set to function at a pressure not to exceed 25% above the maximum working pressure for which the vessel is designed, and not more than the test pressures shown in Table 3. The capacity of relief devices shall be such as to prevent a rise of pressure in the vessel of not more than 10% above the marked relieving pressure.

13.26: All pressure relieving devices for refrigerant containing vessels shall be set and sealed by the manufacturer. The name or trademark of the manufacturer, the pressure setting expressed in pounds per square inch gauge, and the rated discharge capacity expressed in pounds of air per minute, shall be cast or stamped on the device or on a metal plate permanently attached, which shall be the manufacturer's guarantee that the device complies with the requirements of this Code.

13.27: All pressure relieving devices shall be connected as nearly as practicable directly to the pressure vessel or other parts of the system protected thereby and shall be placed above the liquid refrigerant level.

13.28: The seats and discs of pressure relieving devices for refrigerant containing vessels shall be constructed of suitable material to resist refrigerant corrosion.

13.30: When pressure relief devices are vented into the low pressure side of the refrigerating system, the low pressure side shall be provided with a pressure relief device vented to the outside atmosphere and must be set to relieve at not more than 90% of the field test pressures.

13.31: The size of the discharge pipe from pressure relief devices shall not be less than the size of the device outlet. The discharge from more than one relief device may be run into a common header, the area of which shall be equal to the areas of the pipes connected thereto.

13.32: Where ammonia is used, the discharge may be into a tank of water which shall be used for no purpose except ammonia absorption. At least one (1) gallon of fresh water shall be provided for every one (1) pound of ammonia in the system. The water shall be prevented from freezing without the use of salt or chemicals. The tank shall be substantially constructed of not less than one-eighth (1/8) inch or No. 11 U. S. gauge iron or steel. No horizontal dimension of the tank shall be greater than one-half (1/2) the height. The tank shall have a hinged cover, or, if of the enclosed type, shall have a vented hole at the top. All pipe connections shall be through the top of the tank only. The discharge pipe from the pressure relief valves shall discharge the ammonia in the center of the tank near the bottom.

13.33: Where sulphur dioxide is used, the discharge may be into a tank of absorptive brine which shall be used for no purpose except sulphur dioxide absorption. There shall be one gallon of standard dichromate brine (2 1/2 lb. sodium dichromate per gallon of water) for each pound of sulphur dioxide in the system. Brines made with caustic soda or soda ash may be used in place of sodium dichromate, provided the quantity and strength give the equivalent sulphur dioxide absorbing power. The tank shall be substantially constructed of not less than one-eighth (1/8) inch or No. 11 U. S. gauge iron or steel. The tank shall have a hinged cover, or if of the enclosed type, shall have a vent hole at the top. All pipe connections shall be through the top of the tank only. The discharge pipe from the pressure relief valve shall discharge the sulphur dioxide in the center of the tank near the bottom.

13.40: The pressure setting of safety devices for refrigerant containing vessels shall be factory tested with the outlet of the safety device open to the atmosphere and the relief device shall function at a pressure not more than 10% above the pressure marked thereon, if such marking is 100 lb. per square inch or more or at not more than 10 lb. per square inch above the pressure marked thereon if such marking is less than 100 lb. per square inch.

13.41: The discharge capacity of safety devices for refrigerant containing vessels shall be tested with the outlet of the safety device open to the atmosphere and compressed air at a temperature between 50° F. and 100° F. shall be used. With a differential pressure across the seat not greater than the relieving pressure specified in Paragraph 13.40, the measured discharge capacity of the relieving device shall not be less than the rated discharge capacity marked thereon.

13.50: Refrigerant containing vessels, the shells of which have been previously tested under hydrostatic pressure of not less than one and one-half times the maximum allowable working pressure may be finally tested with pneumatic pressure at one and one-half times the maximum allowable working pressure instead of hydrostatic pressure.

13.60: Pressure limiting devices are required on all air cooled systems containing more than twenty (20) pounds of refrigerant and operating above atmospheric pressure, and on all water cooled systems so constructed that the pressure imposing element is capable of producing a pressure in excess of the test pressure.

13.61: Pressure limiting devices shall stop the action of the compressor at a pressure less than 90% of the required pressure relief device setting.

13.70: Compressors of systems containing more than one thousand (1,000) pounds of refrigerant, or compressors of systems containing one

thousand pounds of refrigerant shall be protected. The discharge from such relief device may be piped to the atmosphere or vented into the low pressure side of the system. The inlet size of these relief devices shall be based on the gross displacement of the compressor and shall not be less than the sizes given in Table 2.

13.72: A discharge check valve shall be provided on the discharge line from each compressor used on a refrigerating system containing more than five hundred (500) pounds of a Group (1) refrigerant or more than forty (40) pounds of a Group (2) or Group (3) refrigerant, except where two or more compressors are connected with a common suction and discharge line shall be provided with the discharge check valve in the common discharge line.

13.80: Liquid level gauge glasses, except those of the bull's eye type, shall have automatic closing shut-off valves and such glasses shall be adequately protected against injury.

13.90: Motors of refrigerating systems shall be adequately protected against hazardous overheating under normal or abnormal operating conditions.

Section 14—Tests

14.10: Every refrigerant containing part of every system that is erected on the premises, except compressors or unit assemblies, safety devices, pressure gauges and control mechanisms that are factory tested shall be tested by licensed refrigeration contractors and proved tight after complete installation and before operation under the minimum pressures shown in Table 3.

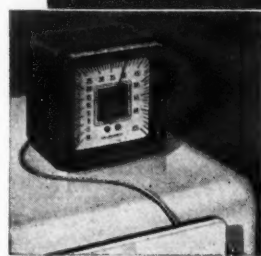
14.11: A dated declaration of test signed by the licensed refrigeration contractor shall be furnished to the Department of Building and Safety Engineering.

14.12: No oxygen or any combustible gas or combustible mixture of gases shall be used for testing.

(Concluded on Page 22, Column 1)

Surely you won't try to go through another season without

the MARSH "Serviceman"



It has the "RECALIBRATOR"

If the Serviceman is knocked out of adjustment simply stir the bulb in cracked ice and water and turn the Recalibrator screw until the pointer records 32°.

The Marsh "Serviceman" was built to do what the pocket thermometer can't do—and it has made good in a big way. The remote reading feature enables you to make tests under actual working conditions—with the refrigerator door closed, for instance, as illustrated opposite.

When not in use the bulb and capillary tubing are neatly concealed in the case. Note the heavy rubber buffer, which prevents damage and protects the instrument.

Use the Serviceman for answering all complaints of too high or too low temperature—testing switch action—checking brine tanks and vessels—in fact, all household or commercial servicing.

Modern facilities and volume production make it possible to sell this precision instrument (in ranges of -10° to +65°F. or -10° to +100°F.) at a dealers net price of only \$5.00 F. O. B. Chicago. (Minus 20° temperature range at slightly higher price).

Jas. P. Marsh Corporation, 2067 Southport Ave., Chicago

MARSH Refrigeration Instruments

GAUGES—THERMOMETERS—RECORDERS—MERCURY SWITCHES



To Insure PROTECTION

from high head pressures, frequency of cycling; blown fuses, or burned-out motors . . . USE

AMINCO

Automatic Suction Pressure Throttling Valve

To avoid starting overloads on compressor motors, permitting motor and compressor to attain top speed on light loads, an automatic throttling valve is definitely required.

It acts similarly to a governor; eliminating an overloaded motor condition due to high back pressures beyond the capacity of the motor to handle continuously without danger.

Simple in action, it protects against the very high back pressures built up in the evaporator, suction line, and compressor crankcase.

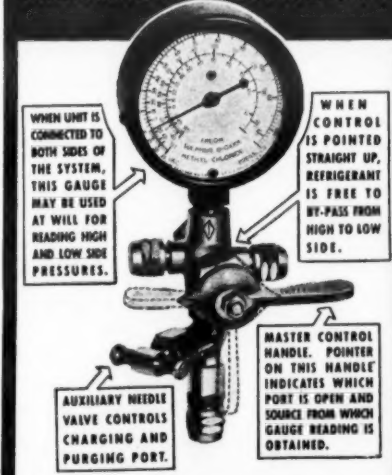
Full details on application.

AMERICAN INJECTOR COMPANY

1481 Fourteenth Avenue DETROIT, MICHIGAN

Pacific Coast Stocks carried by Van D. Clothier, 1015 E. 16th, Los Angeles, Cal.

HI-LO — a new type of CHARGING AND TESTING UNIT



No. 500-C Imperial Hi-Lo Charging and Testing Unit, complete with 2 1/2" gauge. Each \$5.25
No. 501-C Same, less gauge. Each \$3.35

Combines all the advantages of a double gauge unit with the lightness, compactness and ease of handling of a single gauge unit . . .

This is an entirely new type of charging and testing unit which uses a single gauge and a single valve for reading pressures on both sides of the system. It is totally different in operation from the ordinary single gauge unit. Once you try it, you'll find a double gauge unit will do.

Offers the following special advantages:

1. When connected to both sides of the system it permits reading the pressure on either the high side or the low side at any time with a single gauge and a single valve.
2. It permits by-passing at any time without capping the charging and purging port.
3. It may be used separately on either the high side or the low side with exceptional convenience.
4. It is considerably lighter than other units for similar work, fits into closer space and is easier to carry.

This unit can be used for the same variety of purposes as any double gauge or any single gauge unit. Method of operation is simple and convenient (see illustration at left). Once you try the new HI-LO unit we believe you'll agree that it's the handiest and most efficient charging and testing unit you ever used!

Write for new circular.
IMPERIAL BRASS MFG. CO.
565 S. Racine Avenue, Chicago

ORDER FROM YOUR JOBBER

IMPERIAL Air Conditioning and Refrigeration Products

VALVES • FITTINGS • TOOLS • CHARGING LINES • FLOATS • STRAINERS • DEHYDRATORS

You Can Install
SPORLAN
THERMOSTATIC
EXPANSION
VALVES
with Confidence!

KERO TEST
Valves and Fittings
The Standard of the
Industry
Kerotest Manufacturing Co.
Pittsburgh, Pa.

14.13 Test Pressures

Table 3

Refrigerant	Symbol	Minimum Field Test Pressure In Lb./Sq. In. Gauge	
		High Pressure Side	Low Pressure Side
Ammonia	NH ₃	300	150
Butane	C ₄ H ₁₀	90	50
Carbon Dioxide	CO ₂	1,500	1,000
Dichlorodifluoromethane (Freon-12)	CCl ₂ F ₂	235	145
Dichlorotetrafluoroethane (Freon-114)	C ₂ Cl ₂ F ₄	80	50
Dichloromethane (Carrene No. 1, Methylene Chloride)	CH ₂ Cl ₂	30	30
Dichloromono-fluoromethane (Freon-21)	CHCl ₂ F	70	50
Dichloroethylene	C ₂ H ₂ Cl ₂	30	30
Ethane	C ₂ H ₆	1,100	600
Ethyl Chloride	C ₂ H ₅ Cl	60	50
Isobutane	(CH ₃) ₂ CH	130	75
Methyl Chloride	CH ₃ Cl	215	125
Methyl Formate	HCOOCH ₃	50	50
Propane	C ₃ H ₈	325	210
Sulphur Dioxide	SO ₂	170	95
Trichloromono-fluoromethane (Freon-11)	CCl ₃ F	50	30

Instruction Details For Installation Men

(Concluded from Page 21, Column 5)

14.14: For refrigerants not listed in Table 3, the test pressure for the high pressure side shall be not less than the saturated vapor pressure of the refrigerant at 150° F. The test pressure for the low pressure side shall be not less than the saturated vapor pressure of the refrigerant at 115° F. In no case shall the test pressure be less than 30 pounds per square inch by gauge.

Section 15—Instructions

15.10: All refrigerating systems shall be kept clean, free from accumulations of oily dirt, waste and other debris and shall be kept readily accessible at all times. Refrigerating

equipment shall not be jeopardized by the storage of combustible materials.

15.20: It shall be the duty of the person in charge of the premises on which a refrigerating system containing more than twenty (20) pounds of refrigerant is installed, to place a card conspicuously as near as practicable to the refrigerant condensing unit giving directions for the operation of the system, including precautions to be observed in case of a breakdown or leak as follows:

(1) Instructions for shutting down the system in case of emergency.

(2) The name, address and day and night telephone number for obtaining service.

(3) The address and telephone number of the Department of Building and Safety Engineering and instructions to notify said department immediately in case of serious leakage, emergency or accident.

15.30: Each refrigerating system

shall be provided with a legible metal sign permanently attached to the compressor or other prominent part of the system indicating thereon the kind and total number of pounds of refrigerant contained in the system and the field test pressure applied.

15.31: Refrigerating systems containing more than one hundred (100) pounds of refrigerant shall be provided with metal signs having letters of not less than one-half inch (½ inch) in height designating the main shut-off valves to each vessel, main steam or electrical control, remote control switch, and pressure limiting device. On all exposed high pressure and low pressure piping in each room where installed outside the machinery room, shall be signs as above with the name of the refrigerant and the letters (HP or LP).

15.32: Each refrigerant condensing unit shall carry a nameplate marked with the manufacturer's name and address, model or part number, name of refrigerant used, and the manufacturer's test pressure applied.

15.40: One mask or helmet shall be required where amounts of Group (2) or Group (3) refrigerants between twenty-five (25) and one thousand (1,000) pounds, inclusive, are employed. If more than one thousand (1,000) pounds of Group (1) or Group (2) refrigerants are employed, at least two masks or helmets shall be required.

15.41: Only complete helmets or masks marked as approved by the Bureau of Mines of the United States Department of the Interior and suitable for the refrigerant employed shall be used and they shall be kept in a suitable cabinet immediately outside the machinery room or other approved accessible location.

15.42: Canisters or cartridges of helmets or masks shall be renewed immediately after having been used or the seal broken and if unused, shall be renewed at least once every two (2) years. The date of filling shall be marked thereon.

15.50: Not more than two hundred (200) pounds of refrigerant in containers as prescribed by the Interstate Commerce Commission for the transportation of the refrigerant shall be stored in a machinery room, except that a 30-day supply may be maintained in a Class "T" machinery room.

15.51: No refrigerant shall be stored in a room in which less than twenty (20) pounds are used in the refrigerating system.

15.52: Refrigerants on the user's premises in excess of that permitted in the machinery room shall be stored in a fireproof shed or room used for no other purpose, or on the outside of the building.

15.60: No refrigerant container shall be left connected to a refrigerating system except while charging or withdrawing refrigerant.

15.61: Refrigerants withdrawn from refrigerating systems shall only be transferred to containers as prescribed by the Regulations of the Bureau of Explosives, Pamphlet No. 9, Interstate Commerce Commission for the transportation of such refrigerant. No refrigerant shall be discharged to a sewer.

15.62: The containers into which refrigerants are discharged or withdrawn from a refrigerating system, or otherwise used for the handling of refrigerants, shall be carefully weighed each time they are used for these purposes and the containers shall not be filled in excess of the permissible filling weight for such containers and such refrigerants as is prescribed in Pamphlet No. 9 of the Bureau of Explosives, Interstate Commerce Commission with all supplements and re-issues. Containers shall not be recharged unless tested within the time prescribed by the Interstate Commerce Commission and bear no visible defects in the container, valve or fittings.

Wisconsin and Illinois Service Men Meet

MADISON, Wis.—Wisconsin and Northern Illinois members of Refrigeration Service Engineers' Society held an outing at Tenney Park here recently. Attendance, including families and friends of members, neared the 350-mark.

R. P. Sweeney, of Gustave A. Larson Co., was general chairman for the event. He was assisted by Gustave A. Larson, Mead Robertson, Edward King, Phil North, H. A. Struthers, Morris Bakken, R. F. Leibly, Mrs. G. A. Larson, and Mrs. H. A. Struthers, all of Madison.

Officers of the Madison section of the society are Mead Robertson, president; Phil North, secretary; and Glen Reynolds, treasurer.

Service

An Award For Expert Installation Work



Steve Leitner receives first "Diploma of Merit" from W. D. Ambrose of Mills Novelty Co. for making 50 service-free Mills freezer installations.

Detroit Refrigeration Code Is Completed By Committee

(Concluded from Page 1, Column 2)

parts of the country who are working on the code problem.

The proposed code will be submitted to the Detroit Common Council for adoption at the earliest possible date. The draft of the code as published will, of course, be subject to any revisions that the committee might see fit to make before it is submitted to the Council.

During the regular meetings which the code committee has held during the past two years it has met with representatives of manufacturers of equipment, users of systems, property owners, and others in an effort to give all groups who might have an interest in the application of the ordinance a chance to be heard.

The code committee has expressed a hope that publication of the text of the proposed ordinance in the News will acquaint any other interested groups with the provisions of the code as it now stands, so that if they wish to make any point about the proposed ordinance before it reaches the council, they can do so.

The committee made it clear, however, that it will meet only with committees representing specific groups, and that no general, open hearing on the proposed code is planned before it is submitted to the Council.

Personnel of the committee which is submitting the proposed draft is as follows: A. Hafke, engineer, Kelvinator division, Nash-Kelvinator Corp. (chairman of the committee); H. H. Mills, chief safety engineer, Department of Building & Safety Engineering, City of Detroit; O. F. Stauder, manager, Detroit branch, Westerlin & Campbell, distributors for York Ice Machinery Corp.; George B. Bright, Detroit Ice Machine Co., veteran industry consulting engineer and distributor of refrigerating machinery and a past president of the American Society of Refrigerating Engineers, and C. A. Hill, engineer, Mueller Brass Co., Port Huron, Mich. Others who have served on the committee at various times during the draft of the code include the following: D. D. Wile, now associated with Savage Arms Corp.; Frank J. Gleason, now vice president, Copeland Refrigeration Corp.; and J. D. Colyer, vice president, Wolverine Tube Co.

In its provisions the present draft of the proposed Detroit code is basically similar to the proposed revisions of the American Standards Association "Safety Code for Mechanical Refrigeration" which has been prepared by various industry associations and engineering societies working in cooperation with municipal safety authorities, and which is now before the A.S.A. for adoption.

Leitner Gets First Mills Diploma

CHICAGO—As a reward for making more than 50 service-free installations of Mills counter-type ice cream freezers in his territory, Steve Leitner of Leitner Refrigeration Service, Kansas City, Mo., was presented with the first "Diploma of Merit" by W. D. Ambrose, head of the service department of Mills Novelty Co., on a recent visit to headquarters here.

The diploma, signed by Fred Mills, company president, is the first one ever to be awarded to a Mills freezer service man.

New Recorder Features Described In Catalog

BROOKLYN—A new 64-page catalog of Tag indicating, recording, and controlling instruments for temperature and pressure applications has been published by C. J. Tagliabue Mfg. Co. This catalog is profusely illustrated with pictures of installations and construction features.

Included in it are descriptions of the new line of recording thermometers and recording pressure gauges and also indicating and recording controllers.

The new recorder is said to present many new design features, including interchangeable calibrated tube system that can be readily replaced and need be checked at one point only, stainless steel pen arm that may be easily removed, precision-built capillary fountain pen with draftsman's nib, and new pen arm movement supported by bearings at both ends.

In addition to all of the features found in the recording thermometer, the Tag recorder-controller is offered with either the "on-off" or throttling control model. The former is said to fit all temperature control applications, while the throttling model utilizes an adjustable calibrated flapper which provides an exact sensitivity adjustment, making possible adjustment of the throttling range to coincide with any considerable apparatus lag.

Illustrations in the catalog show how the recorders work in actual installations.

Booklet Covers Use Of Brazed Joints

NEW YORK CITY—A new 12-page booklet covering the use of Walseal valves, fittings, flanges, headers, and special parts in air conditioning and refrigeration has been published by Walworth Co. here. The book is titled "Refrigeration & Air Conditioning with Brazed Walseal Joints," and is illustrated with photographs and drawings.

THE BUYER'S GUIDE

THE NEW 1938 C-B KOLD-O-MATIC

Display Cases & Refrigerators Fulfill Constantly Increasing Demands For

- MORE DISPLAY
- MORE EYE APPEAL
- PROPER TEMPERATURE
- PROPER HUMIDITY
- PROVEN CONSTRUCTION
- PROVEN QUALITY

EXCLUSIVE TERRITORIES AVAILABLE FOR QUALIFIED DISTRIBUTORS

THE CINCINNATI BUTCHERS SUPPLY CORPORATION
CINCINNATI, OHIO

TYPE 888

HENRY
COMBINATION
STRAINER
AND LIQUID
INDICATOR



WRITE
FOR
CATALOG

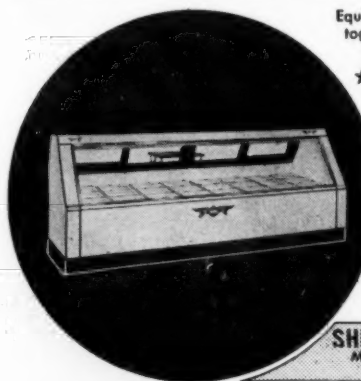
Gas bubbles passing under liquid sight port reveal shortage of refrigerant in system. Soldered brass shell. Sight port cap and gasket provide added seal and protects glass from breakage. Hemispherical screen has 90% greater filtering area than usual flat disc. 120 mesh reinforced brass screen.

HENRY VALVE CO. 1001 19 N. SPAULDING AVE.
CHICAGO, ILLINOIS
STOCKED BY LEADING JOBBERS

Modern... Refrigeration Shafts

For reliable, accurate, time-tested service, Shafts by "MODERN" are regarded as leaders in the refrigeration and air conditioning industry. Send us your blueprints and specifications for estimates on your Shaft requirements.

MODERN MACHINE WORKS, INC. 5353 S. Kirkwood Ave.
Cudahy, Wisconsin



Equipment and Compressor sales go together. Sell both on one contract. The Sherer Franchise Offers:

- ★ COMPLETE LINE OF CASES, COOLERS AND BOXES.
- ★ NEW EQUIPMENT constantly under development, opening new fields for compressor sales.
- ★ LAYOUT DEPARTMENT—layouts for store modernization programs without obligation.
- ★ ADVERTISING—Sherer Equipment advertised by mail and in leading trade publications.

SHERER-GILLET CO. MARSHALL MICHIGAN
Manufacturers of Refrigerated Display and Storage Equipment

PROFIT WITH
Sherer
CASE and
COOLER
FRANCHISE

Write for catalog and franchise details, mentioning territory desired

CLASSIFIED ADVERTISING

RATES: Fifty words or less in 6-point light-face type only, one insertion, \$2.00, additional words four cents each. Three consecutive insertions \$5.00, additional words ten cents each.

PAYMENT in advance is required for advertising in this column.

REPLIES to advertisements with Box No. should be addressed to Air Conditioning & Refrigeration News, 5229 Cass Ave., Detroit, Mich.

REPAIR SERVICE

CONTROL REPAIR SERVICE. Your controls repaired by expert mechanics, with special precision equipment. Supervised by graduate engineers. We stress perfection and dependability before price. One year guarantee on domestic controls. Any bellows operated device repaired. **HALELECTRIC LABORATORY**, 1793 Lakeview Road, Cleveland, Ohio.

GENERAL ELECTRIC and Westinghouse hermetic units rebuilt. Guaranteed unconditionally for one year and returned to you refinished like new. Units are entirely disassembled in our large modern shop, tested through every step of production during rebuilding with the most complete test equipment for accurate work, then subjected to exhaustive running tests under actual operating conditions. Each unit measures to exacting standards after rebuilding. Prices \$30.00 on General Electric DR-1, DR-2, and Westinghouse; \$35.00 on General Electric DR-3. Quotations furnished on other models. Quick service—guaranteed work. **REFRIGERATION MAINTENANCE CORP.**, 365 East Illinois St., Chicago, Ill.

GRUNOW OFFICIAL Service Station established in New York for convenience of dealers throughout New England, New York state and east of Pittsburgh. All compressor exchanges guaranteed and work done under the supervision factory trained experts. Our prices are lowest in the industry. Also save on transportation. Write or wire for special bulletin. Twenty-four hour exchange service. Complete stock on hand. All official Grunow parts. **GRUNOW REFRIGERATION SERVICE, INC.**, 610 West 37th Street, New York City.

WORLD'S LARGEST Rebuilders of hermetic units. Specializing in Majestic, G. E., Westinghouse, Grunow, Frigidaire, Kelvinator, Gibson, Crosley, Norge, Sparton, Leonard, Coldspot, Stewart-Warner, etc. Dealers exchange price \$30.00 with 18 months' written guarantee. Parts for Grunows and Majestics. **G & G GENUINE MAJESTIC REFRIGERATOR AND RADIO PARTS SERVICE**, 5801 Dickens, Chicago.

DOMESTIC CONTROLS repaired: Ranco pencil \$1.75, Ranco box \$2.00, General Electric \$2.00, Tag \$2.00, Cutler-Hammer \$2.00, Penn \$2.00, Bishop Babcock \$2.50, Majestic \$2.50, Penn magnetic \$2.50, G. E. Frigidaire \$2.50. In business over 20 years. Our name is our guarantee. **UNITED SPEEDOMETER REPAIR CO., INC.**, 436 West 57th Street, New York City.

BUSINESS OPPORTUNITIES

LIVE BUSINESS in nation's bright spot of over hundred thousand population. Business well established, location good, natural gas at reasonable rates. Selling with exclusive contracts, Servel Electrolux refrigerators, Tappan divided top gas ranges, Rudd water heaters, Bryant furnaces and Estate gas heatolals. Health forces owner to sell. Box 1078, Air Conditioning & Refrigeration News.

PATENT FOR SALE

AUTOMATIC DEFROSTING Apparatus and System entirely eliminates the human equation and provides for maintaining the evaporator and cooling coils in efficient defrosted condition, while also automatically protecting the food from excessively high temperatures. Patent just recently issued has reasonably broad claims. Complete information on request. Box 1077, Air Conditioning & Refrigeration News.

PATENTS

HAVE YOUR patent work done by a specialist. I have had more than 25 years' experience in refrigeration engineering. Prompt searches and reports. Reasonable fees. **H. R. VAN DEVENTER (ASRE)**, Patent Attorney, 342 Madison Avenue, New York City.

For positive temperature control in beverage cooling—

COLTROL

Write for literature Commercial Coil & Refrig. Co., 457 N. Artesian Ave., Chicago

PAR CONDENSING UNITS 28 MODELS 1-4 TO 20 H. P. WRITE FOR FREE CATALOG. MODERN EQUIPMENT CORP. DEFIANCE, OHIO, U. S. A.

FOR SEAL REPLACEMENTS

USE CHICAGO SEALS. CHICAGO SEAL CO. 3 S. CLINTON ST. — CHICAGO, ILL.

Service Letters

Cleaning Dirty Compressor Castings

129, Dorchester Road
Worcester Park, Surrey, England
Service Editor:

Would you help a regular reader of the News and let me have a reply from you as soon as possible.

The problem is how to clean compressor castings after they are machined. They are very dirty and oily and in some cases I suspect that they have not been sand-blasted.

I have to overhaul and re-erect some small domestic compressors. Some have been in use and continually block up the expansion valve screens. Some have not been used yet.

They seem to be nice jobs, well machined and otherwise very efficient, but the dirt is unbelievable.

Can you advise what to do with them? Shall I have to pickle the castings in something?

Will carbon tetrachloride help me on those that have had SO₂ in them. If so, how shall I use it.

Could you tell me what is meant when an American manufacturer says, "The compressors are cleaned by the Perm-a-clor method."

J. BROPHY

Answer: An authority on service offers the following suggested answer to your questions:

"I would suggest that you boil the castings in a solution of lye and water. I do not believe that the carbon tetrachloride will do you much good.

"In regard to your second question, 'Perm-a-clor' is a solvent made by the Rex Products & Mfg. Co., 13001 Hillview Ave., Detroit, Mich."

Billing Forms For Use By Service Men

McConnell-Richards, Inc.
35 Ridge St., Glen Falls, N. Y.

Sirs: Can you tell us where we might be able to obtain forms for our service men to use containing a bill of materials and labor charges. It seems to us that some company must have these forms and you would be able to tell us.

PAT MCCONNELL

Answer: The Ewell Print Co., 157 Highland St., Brockton, Mass. has available some printed forms for billing and recording refrigeration service work.

Seeks Technical Help On Air Conditioning

4273 Wyoming St.
St. Louis, Mo.

Sirs: Am sending \$1.00 for the book Manual No. A-4. I have the rest and will be glad to get this.

Just received the AIR CONDITIONING & REFRIGERATION NEWS and am sending \$1.00 for the New Steam Jet Data announced by C. H. Rohrbacher of the Heat Exchange Institute.

Also would like to know the price and where to get the new Air-Conditioning Calculator "Slide Rule."

L. F. DUFFAL

Answer: For information concerning the Air-Conditioning Calculator write to Calculator Specialties Co., 122 S. Michigan Ave., Chicago.

If you write to this firm at that street address and fail to get any reply, you might write to B. A. Johnson, c/o Peoples Gas, Light & Coal Co., Chicago. Mr. Johnson was originator of the calculator.

Household Machine Runs Continuously

Lodi, Ohio

Sirs: Enclosed you will find \$3.00 for one of your latest Master Service Manuals.

I would like to know why the Copeland refrigerator we have is hard to get cold enough in the bottom of the box? The ice cubes freeze up in good shape and the frost goes down the full length of the back

of the box, indicating that there is plenty of refrigeration there, but it doesn't get cold enough to shut off the machine.

The oil has been changed in the compressor and the system has been refilled with new gas, also the expansion valve has been replaced, but haven't been able to get the machine to quit running.

GERALD F. UMSTED

Answer: A Copeland factory service expert to whom we referred this inquiry answered as follows:

"From the information given, it appears that the expansion valve is in need of adjustment.

"Since the unit doesn't cut out, this is an indication that the valve may be open too wide, causing a frostback on the line under which condition the control wouldn't cut out."

Service Data on Welsbach Models

136 W. Fifth Ave.
Columbus, Ohio

Editor:

Have you any data or bulletins pertaining to overhauling and servicing of a Welsbach electric refrigerator (residence type)?

I understand such information is in the Master Service Manual, but my copy has become misplaced and I cannot check or verify. If you have any detailed information on this unit please advise what it costs.

C. ROBB

Answer: Special service instructions for the Welsbach household electric refrigerator are published in the "Master Household Refrigeration Service Manual No. 3." This manual is available at a cost of \$1.00.

Service instructions for the following other special types and "orphan" makes are published in this manual:

Allison, Electrice, U. S. Hermetic, Majestic hermetic, Majestic conventional, Socold, and Iroquois.

'Ursa' Oils For Refrigeration Units

Williams & Co., Inc.
Cincinnati, Ohio

Sirs:

In your Master Household Service Manual, covering the Holmes refrigerator, the oil charge is indicated as being 2½ pints of "Ursa" heavy oil.

May we have further details on this oil.

Answer: We have received the following information from the Texas Co., 135 East 42nd St., New York, N. Y.:

"I believe your reader had in mind Texaco Ursa oil. This product is one of our best known pale industrial oils with a viscosity of 750 second S.U. at 100° F.

"While this oil is not generally used for refrigerating or air-conditioning service, it is very widely known and quite prominent in diesel lubrications. It is outstanding for its low carbon forming properties and excellent stability in diesel engine service.

"For your convenience, I am taking this opportunity of forwarding typical tests on this oil. . . ."

Typical Tests on Ursa Oil	
Gravity, API	20.2
Flash Cleveland Open, °F.	400
Fire, °F.	460
Viscosity, S. L. @ 100° F.	769
130° F.	270
210° F.	60
Color, Lovi, 6" cell	150
Pour, °F.	—0
Corrosion, Copper Strip @ 212° F.	No
Neutralization No.	0.04
Carbon Residue, %	0.09

Passman Opens New Branch In Vicksburg

VICKSBURG, Miss. — Passman Equipment Co., Norge distributor in northern Louisiana and the Mississippi delta, has opened a new branch here under the management of Rupert Cook, formerly attached to the company's Shreveport office.

Passman also handles Brunner units and Viking refrigerators.

Higley New President Of Ansul Chemical Co.

(Concluded from Page 1, Column 4)

with Mr. Hood in the Ansul company shortly after the World War. He is credited with having a large share in focusing the attention of the company on the advancement of sulphur dioxide as a refrigerant.

Previous to that time, the company made commercial sulphur dioxide for use in textile and bleaching industries, and for the preservation of fruit. Presence of moisture in the commercial product was then not considered an impurity, provided it did not cause deterioration of shipping equipment, or of the customer's apparatus.

With the advent of electric refrigeration and the increasing use of sulphur dioxide as a refrigerant, the company began experimenting with the chemical to remove excess moisture from it, and thus avoid contamination of the product in transit and injury to refrigeration compressor cylinders.

Methyl chloride as a companion chemical to sulphur dioxide was added to the Ansul line in 1934.

Schedule of Meetings Announced By A.S.R.E.

(Concluded from Page 1, Column 5)

and is renowned as a model industrial community. It has a splendid golf course and other facilities.

At the meeting last month it was voted that the program committee recommend to the council the adoption of a proposed schedule of meetings contained in a report on meeting places presented by David L. Fiske, executive secretary of the society.

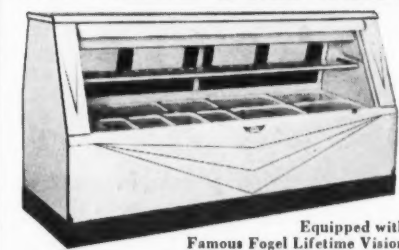
This proposed schedule of meetings is as follows:

October, 1938, conference, Knoxville, Tenn.; December, 1938, annual meeting, New York City; April, 1939, conference, Austin, Texas; May, 1939, spring meeting, Hershey, Pa.; October, 1939, conference, Lafayette, Ind.; January, 1940, annual meeting, Cleveland, Ohio; April, 1940, conference, College Park, Md. or Ithaca, N. Y.; June, 1940, spring meeting, Milwaukee.

The Knoxville Food Conference scheduled for October of this year was discussed, and it was decided that it would be held either Oct. 19-21 or 20-22.

THE BUYER'S GUIDE

'NO NEED FOR COSTLY SERVICE CALLS'



Equipped with Famous Fogel Lifetime Vision

Many Fogel dealers have made this statement. . . Why?

Fogel trouble-free performance is based on sound engineering, skilled construction, and highest quality materials.

Inquire today about our complete line of refrigerated food storage and display equipment.

Interesting distributor proposition to qualified firms.

FOGEL REFRIGERATOR COMPANY Since 1899
16th & Vine Sts., Phila., Pa.

MILLS COMPRESSORS

for Commercial Use

Mills Novelty Company • 4100 Fullerton Avenue • Chicago, Illinois

TYLER WELDED STEEL Refrigerators

● DEALERS who have the Tyler line are making surprising sales records. Tyler's welded steel construction and big values offer a tremendous advantage. Complete line. Unlimited prospects. Top Display . . . Double Duty . . . Delicatessen Cases . . . Reach-ins . . . Walk-ins. Wide range of sizes. Beautiful, modern, streamlined designs. Latest engineering improvements. Write now for dealer catalog.

TYLER FIXTURE CORPORATION, Dept. E, Niles, Mich.
New York Office: 601 W. 26th St. Chicago Office: 1663 W. Ogden Ave.

SIZES AND TYPES TO TAKE CARE OF EVERY PROSPECT

MAKE OVER 41% CLEAR PROFIT with GILMER 35-R BELT ASSORTMENT
YOU PAY \$19.98
YOU GET \$34.18
YOU MAKE \$14.20

Described and illustrated in 1938 Gilmer Belt Catalog. Use Gilmer f.h.p. Belts. Belt engineers build them. Get your Gilmer Catalog today.

L. H. GILMER COMPANY, Tacony, Philadelphia

Chieftain Message No. 5

CAN WE HELP YOU?— Yes! If it is compressors, we have it.
If it is units, we have it.

TECUMSEH PRODUCTS CO., TECUMSEH, MICH.